WAP-6102

300Mbps *N_Max*
Wireless Ceiling PoE Access Point

User Manual

V1.0

Notice

FCC Warning

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions： (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures：

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Shielded interface cables must be used in order to comply with emission limits.

CE Statement

LEVEL ONE hereby declares that this device is in compliance with the essential requirement and other relevant provisions of the R&TTE Directive 1999/5/EC.

This device will be sold in the following EEA countries：Austria, Italy, Belgium, Liechtenstein, Denmark, Luxembourg, Finland, Netherlands, France, Norway, Germany, Portugal, Greece, Spain, Iceland, Sweden, Ireland, United Kingdom, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Slovakia, Poland, Slovenia, Bulgaria, Romania.

Preface

This guide is for the experienced user who installs and manages the N_Max WAP-6010 product hereafter referred to as the “device”. To use this guide, you should have experience working with the TCP/IP configuration and be familiar with the concepts and terminology of wireless local area networks.

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1. Introduction

WAP-6102 is a powerful and multi-functioned 11n Access Point and it can act three modes AP/WDS/Universal Repeater. Smoke detector appearance will minimize visibility. So this model can work properly at Hotel or public area.

WAP-6102 is a Wireless Network device that delivers up to 6x faster speeds and 7x extended coverage than 802.11g devices. Product's RF performance is finely tuned so it will bring best wireless signal for each client. WAP-6102 supports home network with superior throughput, performance and unparalleled wireless range. To protect data during wireless transmissions, WAP-6102 encrypts all wireless transmissions through WEP data encryption and supports WPA/WPA2. Its MAC address filter allows users to select stations with access to connect network. WAP-6102 thus is the best product to ensure network quality for hotspots.

1.1. Features and Benefits

Features	Benefits
High Speed Data Rate Up to 300Mbps	**Capable of handling heavy data payloads such as MPEG video streaming**
IEEE 802.11n draft Compliant and backward compatible with 802.11b/g	**Fully compatible with IEEE 802.11b/g/n devices**
Multi-modes selectable	**Allowing users to select AP/WDS/Universal Repeater mode in various application**
Point-to-point, Point-to-multipoint Wireless Connectivity	**Allowing to transfer data from buildings to buildings**
WDS (Wireless Distributed System)	**Making wireless AP and Bridge mode simultaneously as a wireless repeater**
Universal Repeater	**The easiest way to your wireless network's coverage**
Support Multi-SSID function (4 SSID) in AP mode	**Allowing clients to access different networks through a single access point and to assign different policies and functions for each SSID by manager**
WPA2/WPA	**Powerful data security**
MAC address filtering in AP mode	**Ensuring secure network connection**
User isolation support (AP mode)	**Protecting the private network between client users.**
Power-over-Ethernet (IEEE802.3af)	**Flexible Access Point locations and saving cost**
Keep personal setting	**Keeping the latest setting when firmware upgrade**
SNMP Remote Configuration Management	**Helping administrators to remotely configure or manage the Access Point easily**
QoS (WMM) support	**Enhancing user performance and density**

1.2. Package Contents

The package contains the following items. In case of return, please keep the original box set, and the complete box set must be included for full refund.

- 1 WAP-6102
- 1 12V/1A 100V~240V Power Adapter
- 1 CD-ROM with User's Manual
- 1 Quick Installation Guide
- 1 Cat5 UTP Cable
- 2 Mounting Bracket
- 2 Screws

1.3. System Requirement

The following are the minimum system requirements in order to configure the device.

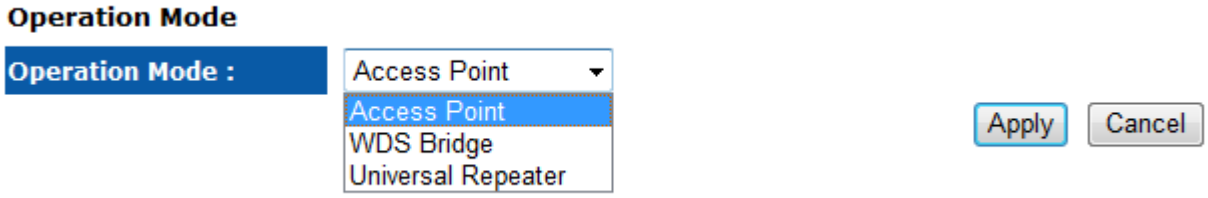
- PC/AT compatible computer with an Ethernet interface.
- Operating system that supports HTTP web-browser

2. Web Configuration

2.1. System

2.1.1. Operation Mode

You are allowed to configure WAP-6102 into different modes: AP, WDS Bridge and Universal Repeater.



AP/WDS/Universal Repeater

Access Point

In AP (Access Point) mode, your device acts as a communication hub for users with a wireless device to connect to a wired LAN/WAN.

Please refer to:
Chapter 2.2.1Access Point Configuration (Page. 9) for operation under AP Mode

WDS Bridge

You can only connect to the device via Wireless Client

WDS (Wireless Distribution System) allows AP to communicate with one another wirelessly. This capability is critical in providing a seamless experience for roaming clients and for managing multiple wireless networks.

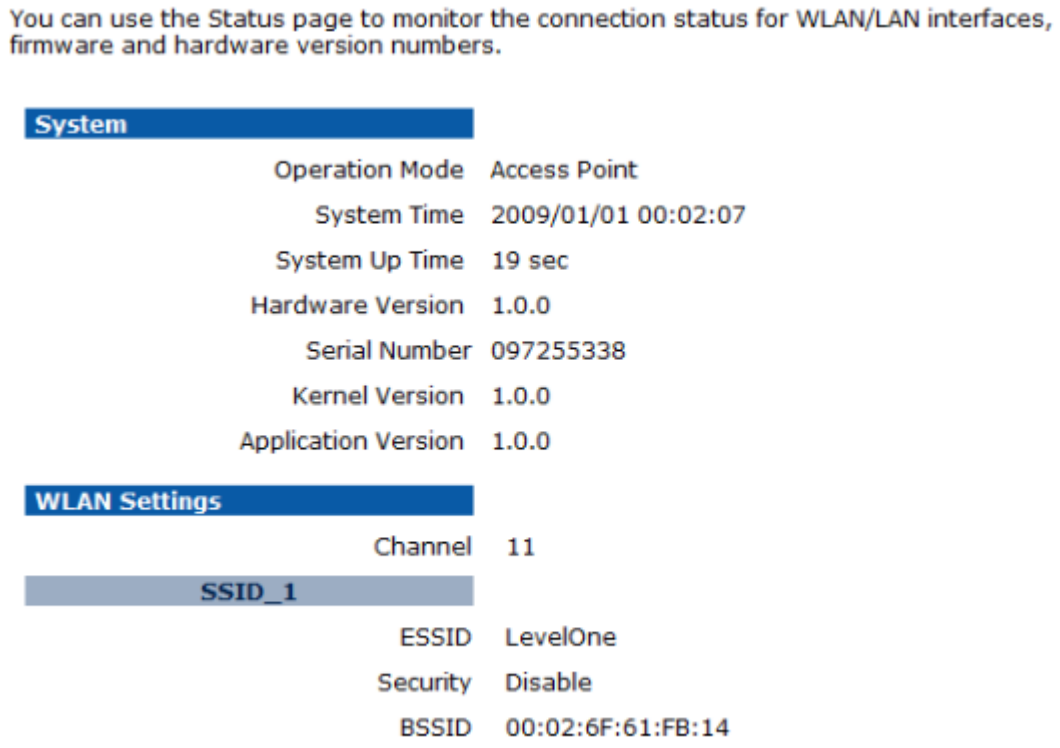
Please refer to:
Chapter 2.2.2 WDS Bridge Configuration (Page. 22) for operation under WDS Mode

Universal Repeater

Repeater is used to regenerate or replicate signals that are weakened or distorted by transmission over long distances and through areas with high levels of electromagnetic interference (EMI). Universal Repeater (AP) mode on one radio channel is usually configured along with Universal Repeater (STA) mode on another radio channel.

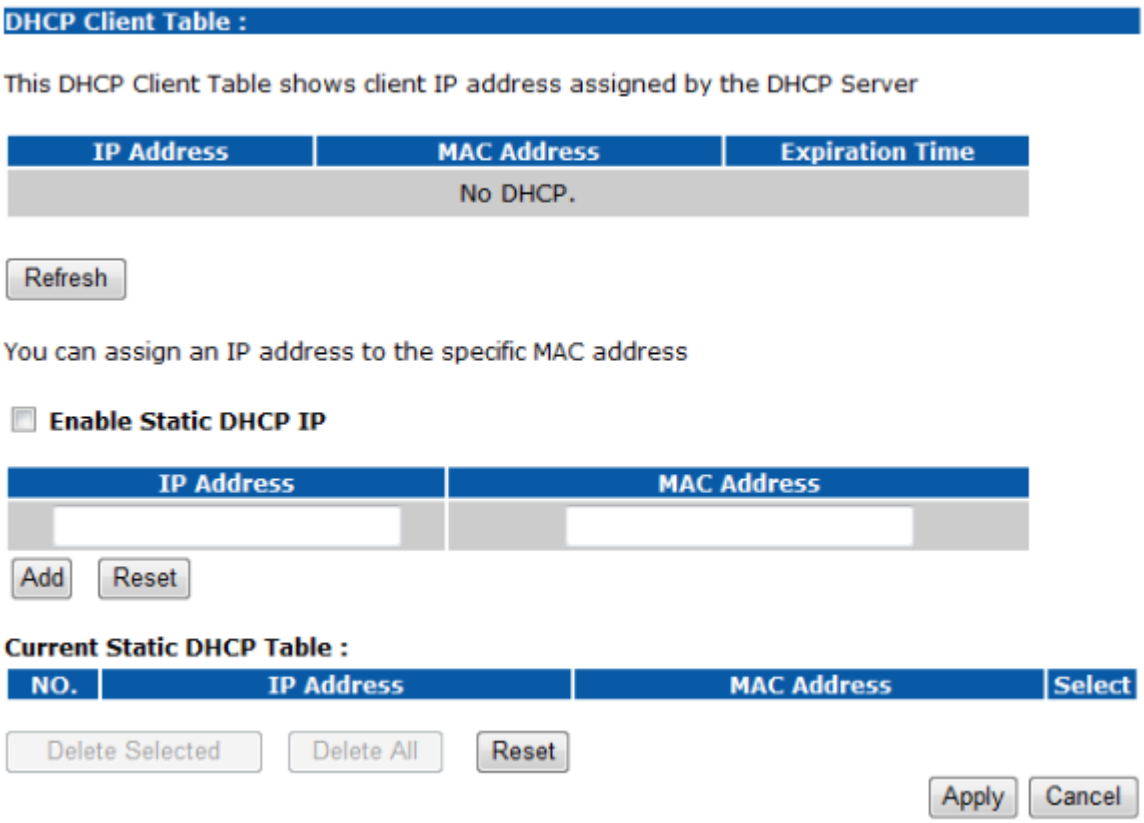
Please refer to:
Chapter 2.2.3 Universal Repeater Configuration (Page. 27) for operation under Repeater Mode

2.1.2. Status

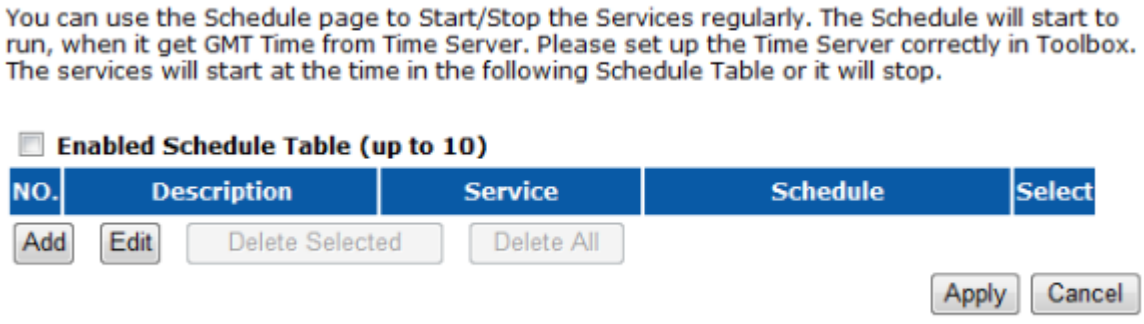


- System: Basic information of the device.
- WLAN Settings: WLAN channel.
- SSID_1: SSID information.

2.1.3. DHCP

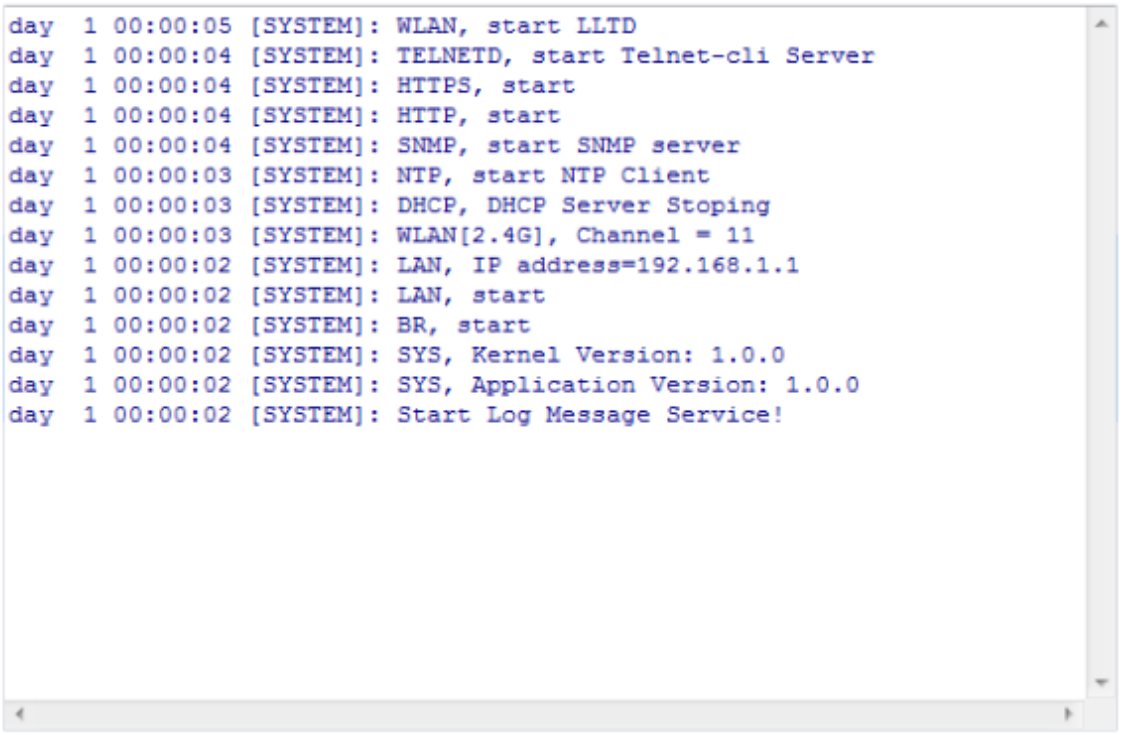


2.1.4. Schedule


You can use the Schedule page to Start/Stop the Services regularly. The Schedule will start to run, when it get GMT Time from Time Server. Please set up the Time Server correctly in Toolbox. The services will start at the time in the following Schedule Table or it will stop.
Enabled Schedule Table (up to 10)
NO.
Description
Service
Schedule
Select
Add
Edit
Delete Selected
Delete All
Apply
Cancel

2.1.5. Event Log

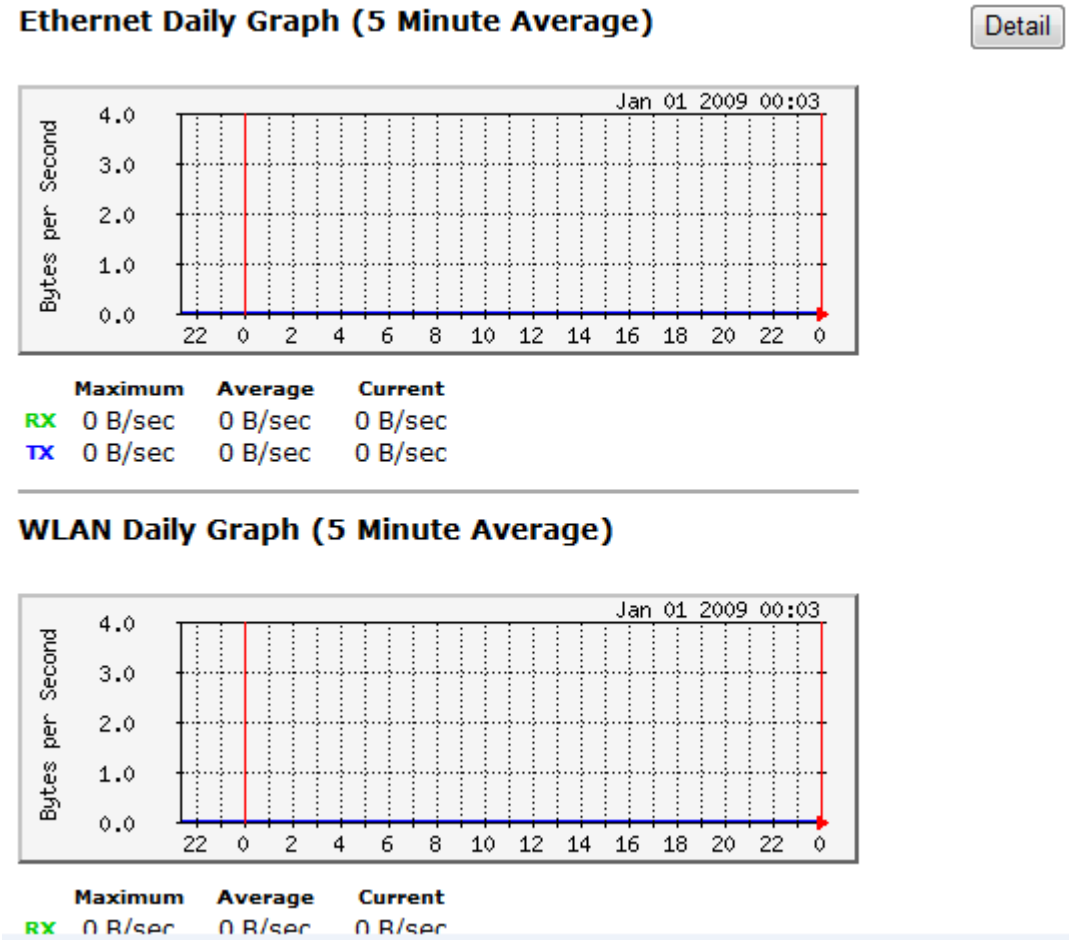
View the system operation information.


day 1 00:00:05 [SYSTEM]: WLAN, start LLTD
day 1 00:00:04 [SYSTEM]: TELNETD, start Telnet-cli Server
day 1 00:00:04 [SYSTEM]: HTTPS, start
day 1 00:00:04 [SYSTEM]: HTTP, start
day 1 00:00:04 [SYSTEM]: SNMP, start SNMP server
day 1 00:00:03 [SYSTEM]: NTP, start NTP Client
day 1 00:00:03 [SYSTEM]: DHCP, DHCP Server Stoping
day 1 00:00:03 [SYSTEM]: WLAN[2.4G], Channel = 11
day 1 00:00:02 [SYSTEM]: LAN, IP address=192.168.1.1
day 1 00:00:02 [SYSTEM]: LAN, start
day 1 00:00:02 [SYSTEM]: BR, start
day 1 00:00:02 [SYSTEM]: SYS, Kernel Version: 1.0.0
day 1 00:00:02 [SYSTEM]: SYS, Application Version: 1.0.0
day 1 00:00:02 [SYSTEM]: Start Log Message Service!

Save Clear Refresh

2.1.6. Monitor

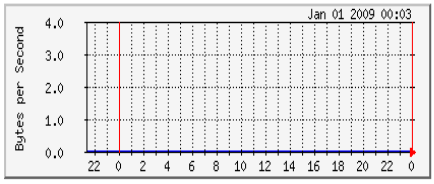
The device will record the router transmission status in a time span.



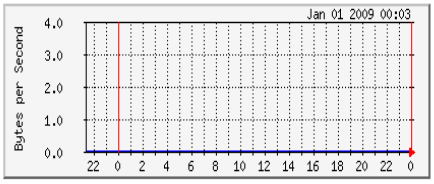
- Detail: Click into detail to see historical record.

Detail:

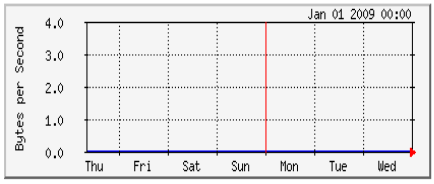
Ethernet Daily Graph (5 Minute Average)



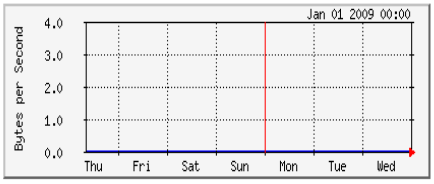
WLAN Daily Graph (5 Minute Average)



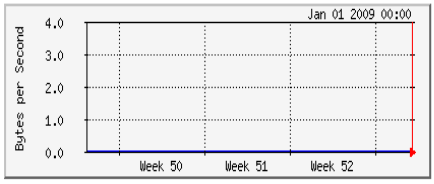
Ethernet Weekly Graph (30 Minute Average)



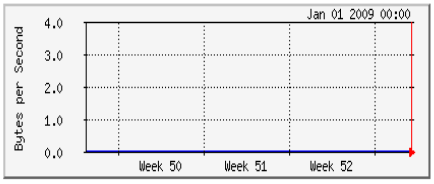
WLAN Weekly Graph (30 Minute Average)



Ethernet Monthly Graph (2 Hour Average)



WLAN Monthly Graph (2 Hour Average)



	Maximum	Average	Current
RX	0 B/sec	0 B/sec	0 B/sec
TX	0 B/sec	0 B/sec	0 B/sec

	Maximum	Average	Current
RX	0 B/sec	0 B/sec	0 B/sec
TX	0 B/sec	0 B/sec	0 B/sec

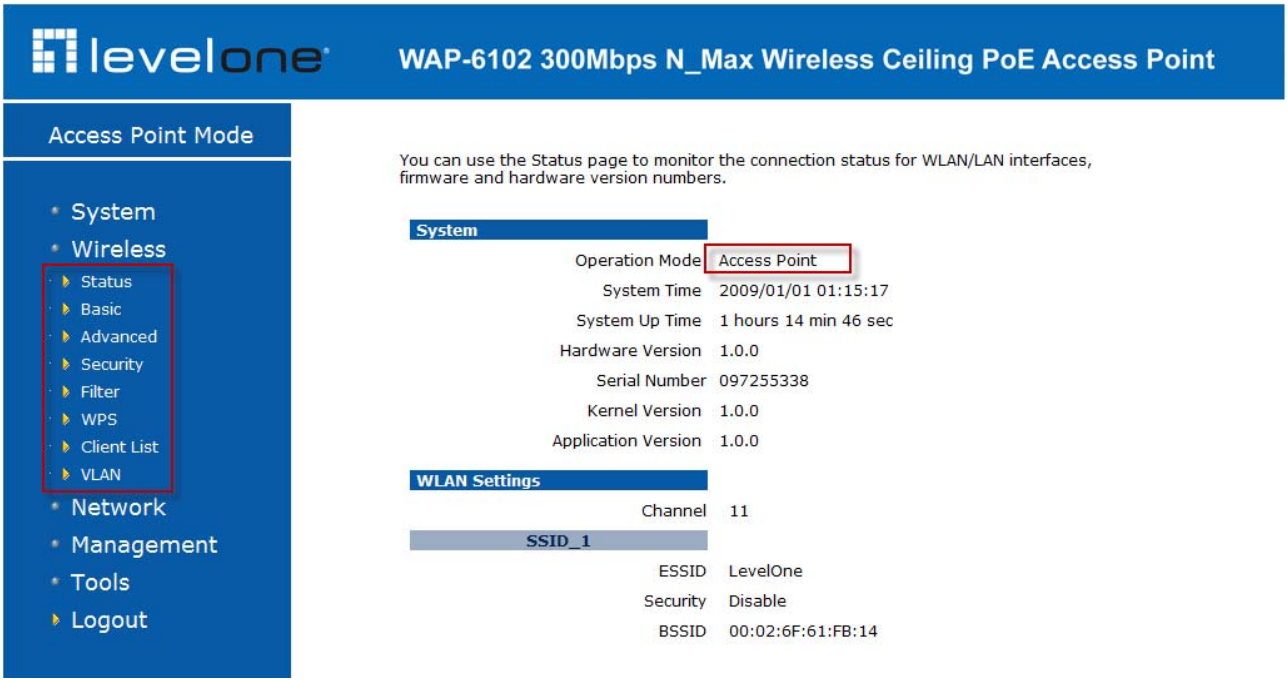
UPTIME: **3 min 49 sec**

2.2. Wireless

2.2.1 Access Point Configuration

Please click **System➔ Operation Mode** and Select **Access Point** before you start the configuration

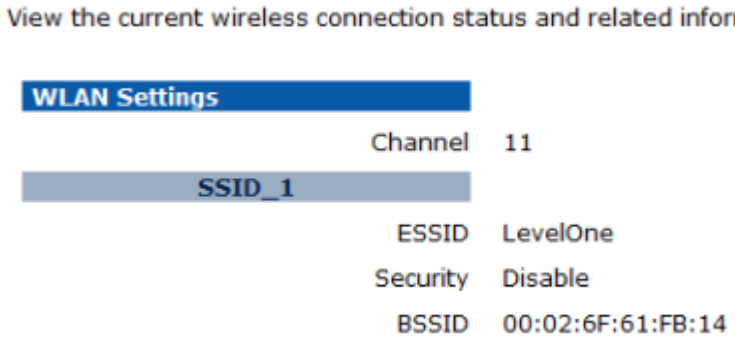
AP Mode



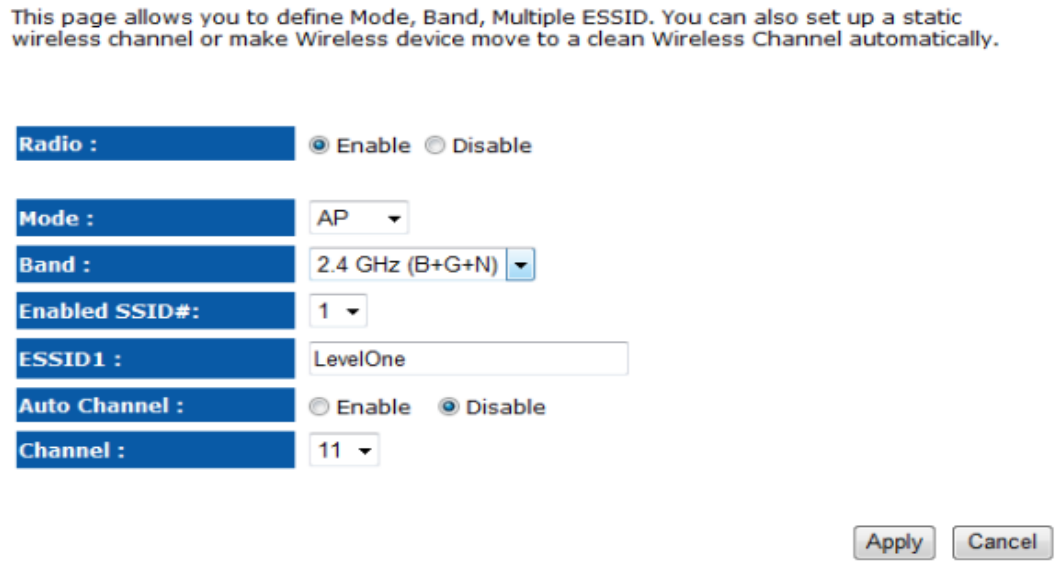
To configure AP Mode, please select Access Point in (**System➔ Operation Mode**)

(Please refer to: 2.1.1 Operation Mode in Page.3)

Status



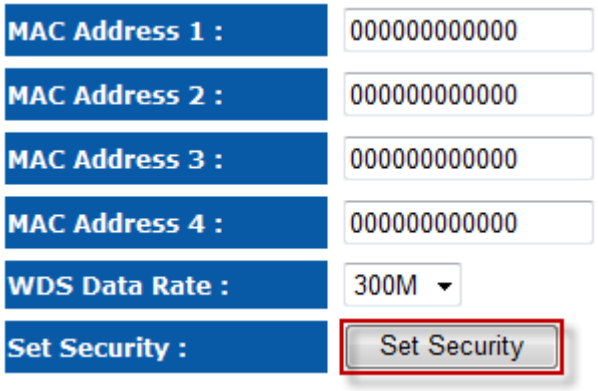
Basic


This page allows you to define Mode, Band, Multiple ESSID. You can also set up a static wireless channel or make Wireless device move to a clean Wireless Channel automatically.
Radio : Enable Disable
Mode : AP
Band : 2.4 GHz (B+G+N)
Enabled SSID#: 1
ESSID1 : LevelOne
Auto Channel : Enable Disable
Channel : 11
Apply Cancel

- **Radio**: To enable/disable radio frequency.
- **Mode**: Select and define your device in AP mode or WDS mode
  - ✓ **Mode**: **AP**

    To define your AP as a regular AP
  - ✓ **Mode: WDS** (AP+WDS)

    To define your device work in WDS + AP function, this mode is to interlink this device with other AP devices in Wireless Distribution System. Once you select this mode the table as below will shows up.



    You are allowed to set MAC address and encryption algorithm
    - **Set Security:** (Please refer to Security in **Page. 25** for encryption configuration)

- **Band:** Configure the device into different wireless modes.
  - ✓ **2.4 GHz (B)**
  - ✓ **2.4 GHz (N)**
  - ✓ **2.4 GHz (B+G)**
  - ✓ **2.4 GHz (G)**
  - ✓ **2.4 GHz (B+G+N)**
- **Enabled SSID#:** The device allows you to add up to 4 unique SSID
- **ESSID#:** Description of each configured SSID
- **Auto Channel:** To enable/disable devices auto-detect channel used
- **Check Cannel Time (Channel):** When Auto Channel is enabled; you can configure the channel detection interval. When Auto Channel is disabled; you can manually configure a channel to be used.

Advanced

These settings are only for expert user who is familiar with Wireless LAN procedure. Do not change these settings unless you know what effect the changes will have on your AP. Incorrect settings might reduce wireless performance.

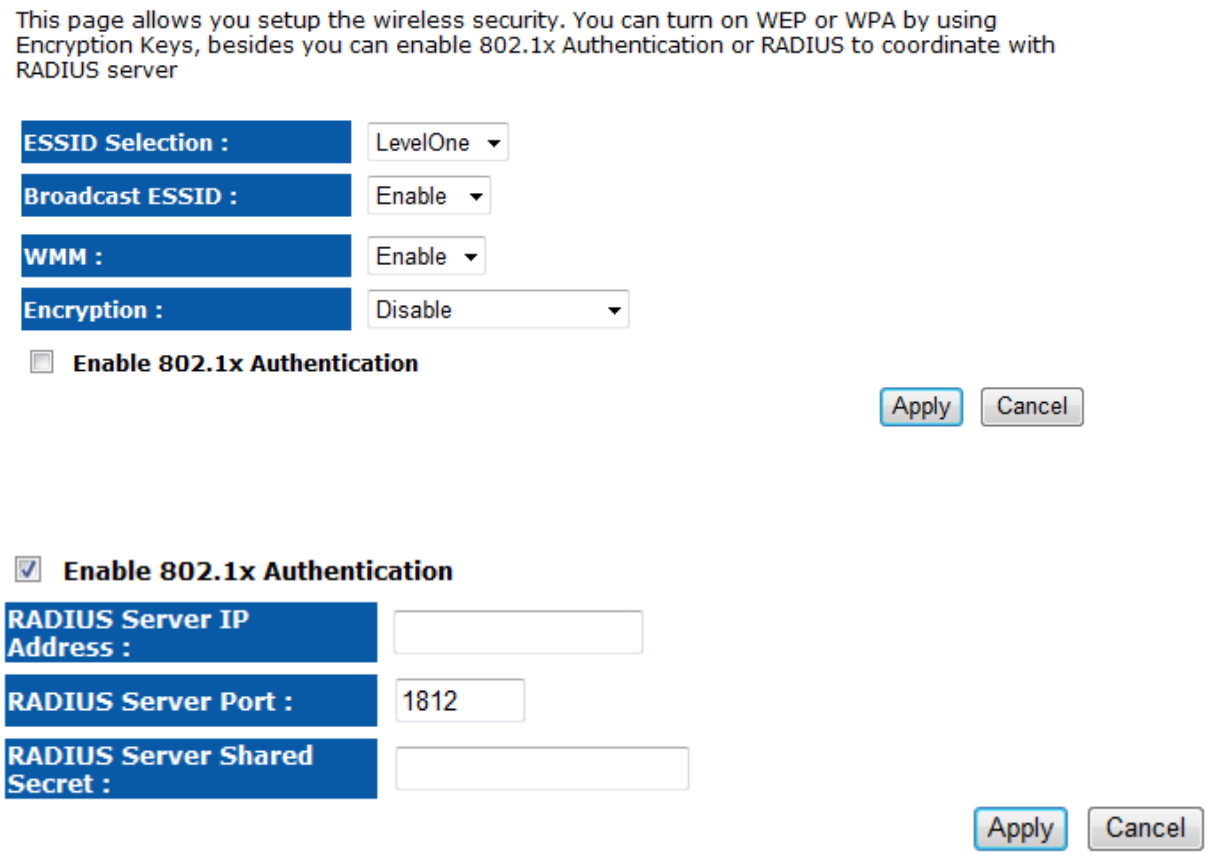
Fragment Threshold :	2346 (256-2346)
RTS Threshold :	2347 (1-2347)
Beacon Interval :	100 (20-1024 ms)
DTIM Period :	1 (1-255)
N Data Rate:	Auto
Channel Bandwidth	Auto 20/40 MHZ / 20 MHZ
Preamble Type :	Long Preamble / Short Preamble
CTS Protection :	Auto / Always / None
Tx Power :	100 %
Isolation :	Enable / Disable

Apply Cancel

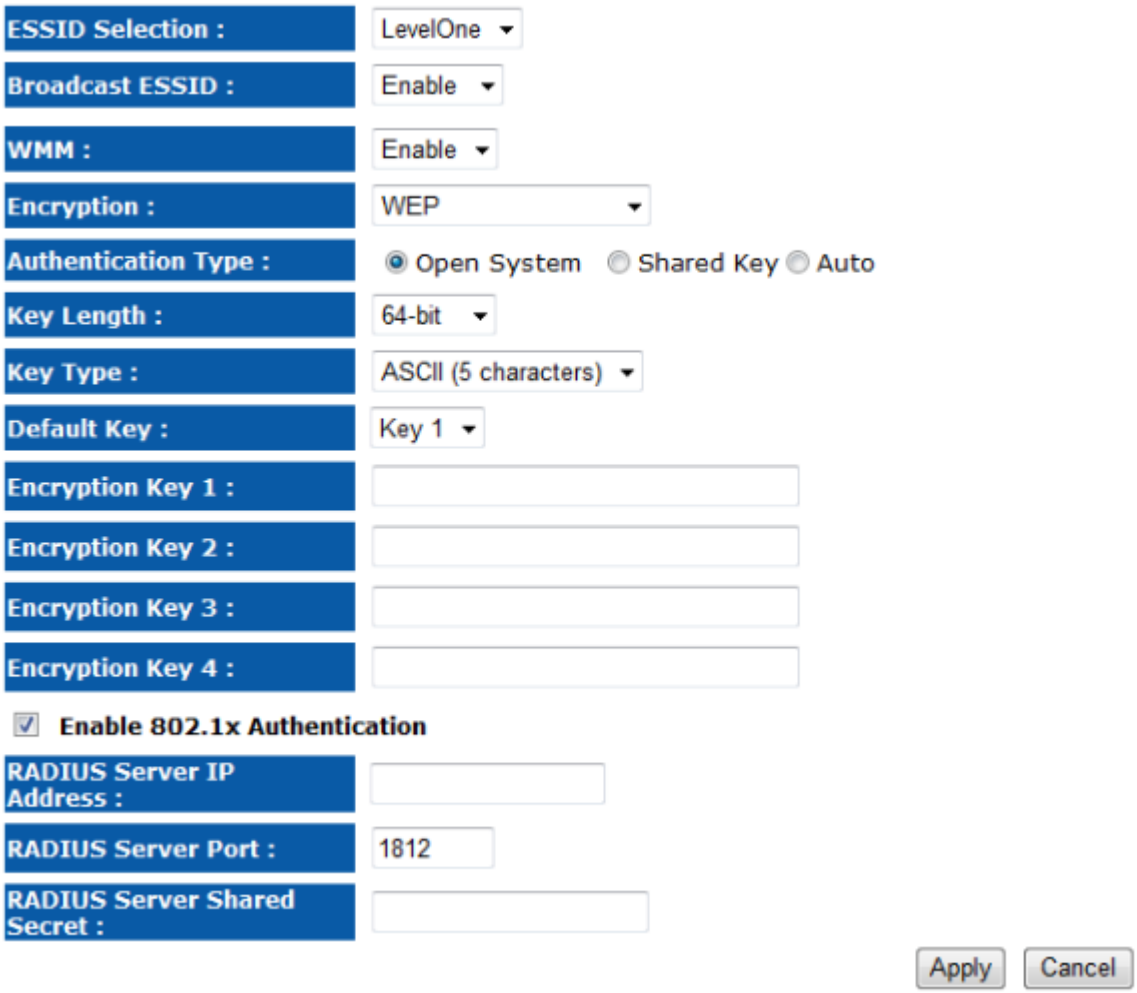
- **Fragment Threshold:** Packets over the specified size will be fragmented in order to improve performance on noisy networks. Specify a value between 256 and 2346. The default value is 2346.
- **RTS Threshold:** Packets over the specified size will use the RTS/CTS mechanism to maintain performance in noisy networks and preventing hidden nodes from degrading the performance. Specify a value between 0 and 2347. The default value is 2347.
- **Beacon Interval:** Beacons are packets sent by a wireless Access Point to synchronize wireless devices. Specify a Beacon Interval value between 24 and 1024. The default value is set to 100 milliseconds.
- **DTIM Period:** A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages. When the wireless Access Point has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Period value. Wireless clients detect the beacons and awaken to receive the broadcast and multicast messages. The default value is 1. Valid settings are between 1 and 10.
- **N Data Rate:** You may select N data rate from the drop-down list, however, it is recommended to select **auto**.
- **Channel Bandwidth:** Select channel bandwidth.
- **Preamble Type:** Select a short or long preamble. For optimum performance it is recommended to also configure the client device as the same preamble type.
- **CTS Protection:** CTS (Clear to Send) can be always enabled, auto, or disabled. By enabled CTS, the Access Point and clients will wait for a 'clear' signal before transmitting. It is recommended to select **auto**.
- **Tx Power:** You may control the transmit output power of the device by selecting a value from the drop-down list. This feature can be helpful in restricting the coverage area of the wireless network.
- **Isolation**: Protect the private network between client users

Security

➢ Encryption: Disabled

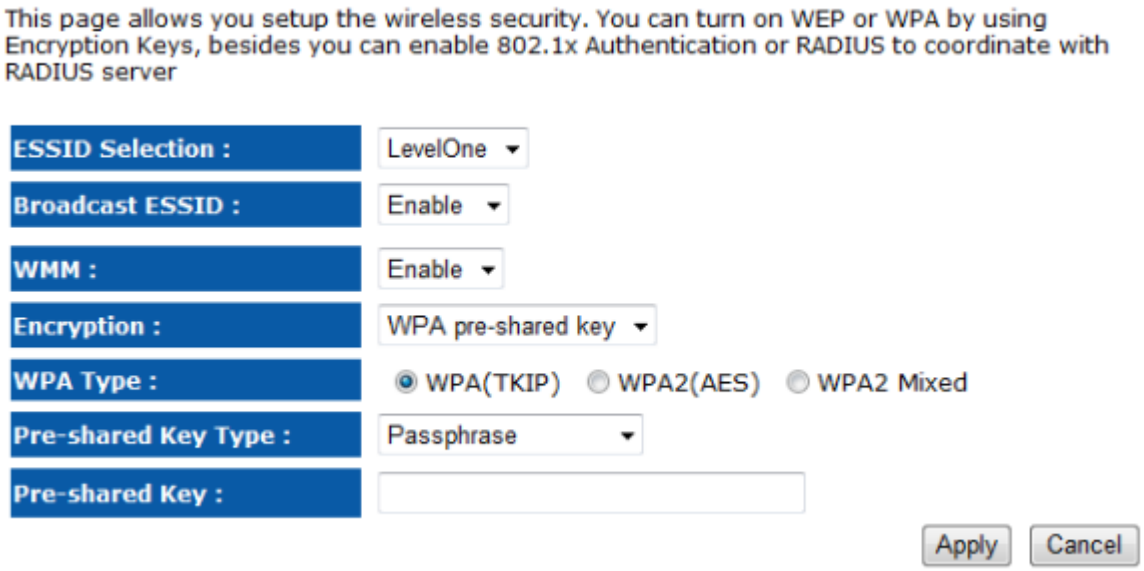


➢ Encryption: WEP



- **ESSID Selection**: As this device supports multiple SSIDs, it is possible to configure a different security mode for each SSID (profile). Select an SSID from the drop-down list.
- **Broadcast SSID**: Select **Enable** or **Disable** from the drop-down list. This is the SSID broadcast feature. When this option is set to Enable, your wireless network name is broadcast to anyone within the range of your signal. If you're not using encryption then they could connect to your network. When this is disabled, you must enter the Wireless Network Name (SSID) on the client manually to connect to the network.
- **WMM**: Choose to **Enable** or **Disable** WMM. This is the Quality of Service (QoS) feature for prioritizing voice and video applications.
- **Encryption**: Select **WEP** from the drop-down list.
- **Authentication Type:** Select **Open System**, **Shared Key, or auto**. Authentication method from the drop-down list. An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. Shared Key sends an unencrypted challenge text string to any device attempting to communicate with the AP. The device requesting authentication encrypts the challenge text and sends it back to the access point. If the challenge text is encrypted correctly, the access point allows the requesting device to authenticate. It is recommended to select Auto if you are not sure which authentication type is used.
- **Key Length**: Select a **64-bit** or **128-bit** WEP key length from the drop-down list.
- **Key Type**: Select a key type from the drop-down list. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in **HEX** (hexadecimal - using characters 0-9, A-F) or **ASCII** (American Standard Code for Information Interchange - alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember.
- **Default Key**: You may choose one of your 4 different WEP keys from below.
- **Encryption Key 1-4:** You may enter four different WEP keys.
- **Enable 802.1x Authentication**: Place a check in this box if you would like to use RADIUS authentication. This option works with a RADIUS Server to authenticate wireless clients. Wireless clients should have established the necessary credentials before attempting to authenticate to the Server through this Gateway. Furthermore, it may be necessary to configure the RADIUS Server to allow this Gateway to authenticate users. You will then be required to specify the RADIUS Server's IP address, port, and password.

➢ Encryption: WPA pre-shared key



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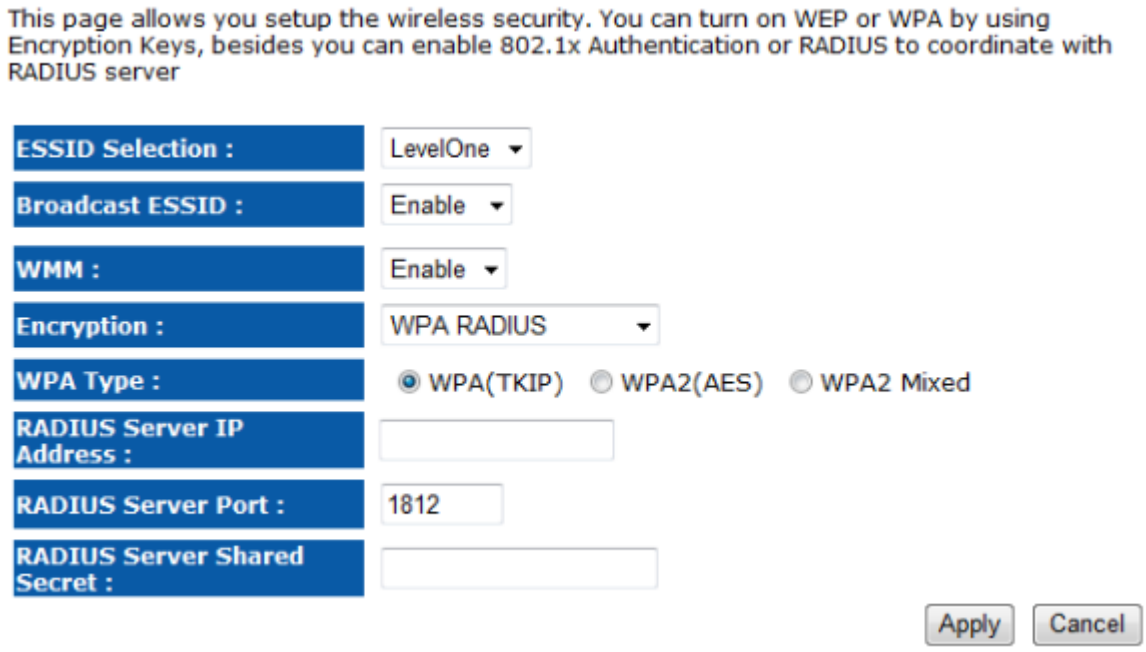
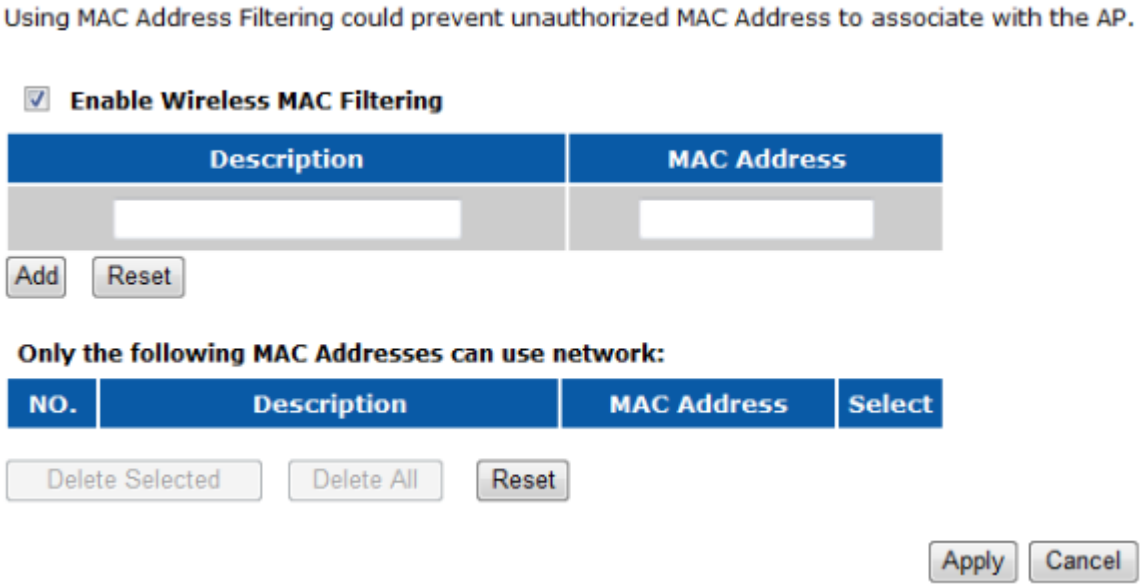
- **WMM**: Choose to **Enable** or **Disable** WMM. This is the Quality of Service (QoS) feature for prioritizing voice and video applications.
- **Encryption**: Select **WPA pre-shared key** from the drop-down list.
- **WPA Type**: Select TKIP, AES, or WPA2 Mixed. The encryption algorithm used to secure the data communication. **TKIP** (Temporal Key Integrity Protocol) provides per-packet key generation and is based on WEP. **AES** (Advanced Encryption Standard) is a very secure block based encryption. Note that, if the bridge uses the AES option, the bridge can associate with the access point only if the access point is also set to use only AES.
- **Pre-shared Key Type**: The Key Type can be **passphrase** or **Hex** format.
- **Pre-Shared Key**: The key is entered as a pass-phrase of up to 63 alphanumeric characters in ASCII (American Standard Code for Information Interchange) format at both ends of the wireless connection. It cannot be shorter than eight characters, although for proper security it needs to be of ample length and should not be a commonly known phrase. This phrase is used to generate session keys that are unique for each wireless client.

➢ Encryption: WPA RADIUS

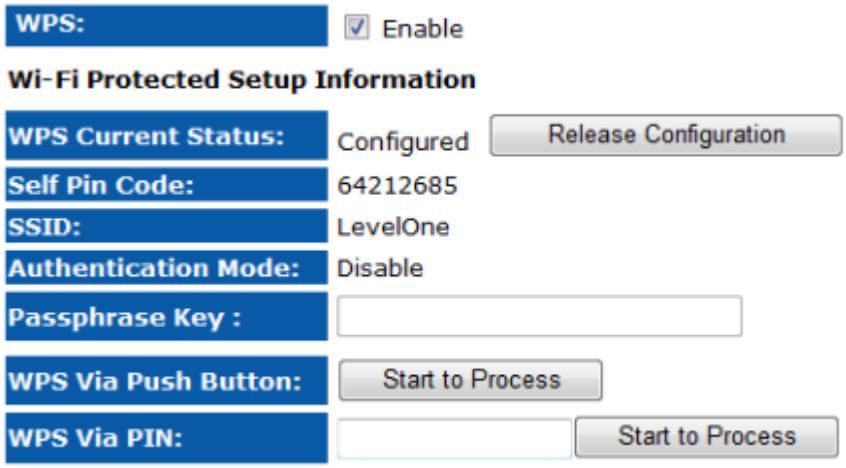


- **ESSID Selection**: As this device supports multiple SSIDs, it is possible to configure a different security mode for each SSID (profile). Select an SSID from the drop-down list.
- **Broadcast SSID**: Select **Enable** or **Disable** from the drop-down list. This is the SSID broadcast feature. When this option is set to Enable, your wireless network name is broadcast to anyone within the range of your signal. If you're not using encryption then they could connect to your network. When this is disabled, you must enter the Wireless Network Name (SSID) on the client manually to connect to the network.
- **WMM**: Choose to **Enable** or **Disable** WMM. This is the Quality of Service (QoS) feature for prioritizing voice and video applications.
- **Encryption**: Select **WPA RADIUS** from the drop-down list.
- **WPA Type**: Select TKIP, AES, or WPA2 Mixed. The encryption algorithm used to secure the data communication. **TKIP** (Temporal Key Integrity Protocol) provides per-packet key generation and is based on WEP. **AES** (Advanced Encryption Standard) is a very secure block based encryption. Note that, if the bridge uses the AES option, the bridge can associate with the access point only if the access point is also set to use only AES.
- **RADIUS Server IP Address**: Specify the IP address of the RADIUS server.
- **RADIUS Server Port**: Specify the port number of the RADIUS server, the default port is 1812.
- **RADIUS Server Password**: Specify the pass-phrase that is matched on the RADIUS Server.

Filter

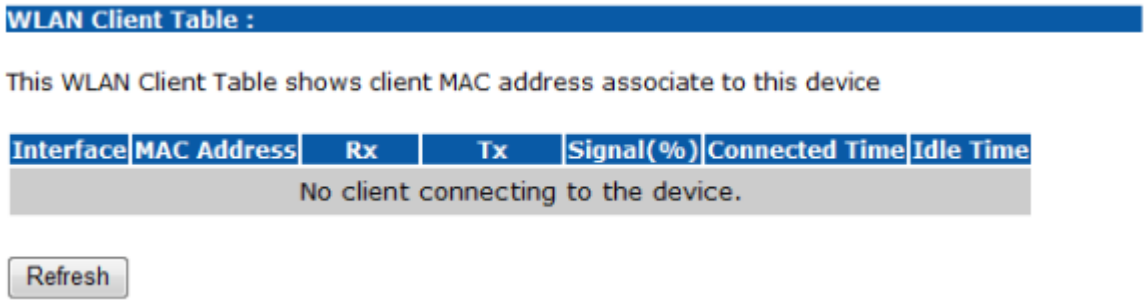

Using MAC Address Filtering could prevent unauthorized MAC Address to associate with the AP.
Enable Wireless MAC Filtering
Description
MAC Address
Add
Reset
Only the following MAC Addresses can use network:
NO.
Description
MAC Address
Select
Delete Selected
Delete All
Reset
Apply
Cancel

WPS

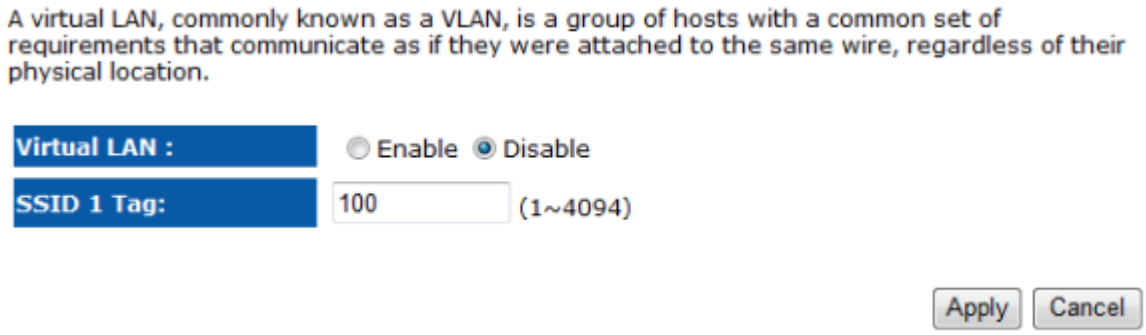

WPS:
Enable
Wi-Fi Protected Setup Information
WPS Current Status:
Configured
Release Configuration
Self Pin Code:
64212685
SSID:
LevelOne
Authentication Mode:
Disable
Passphrase Key :
WPS Via Push Button:
Start to Process
WPS Via PIN:
Start to Process

- **WPS Current Status:** Display current configuration is configured or un-configured. The default setting will display un-configured status but if any of following occur will display configured status: 1. Configuration by an external registrar. 2. Automatic configuration by internal registrar. 3. Manual configuration by user.
- **Self Pin Code:** Pin code is unique and automatically generated.
- **SSID:** Display wireless network name
- **Authentication Mode:** Display wireless network authentication types
- **Passphrase Key:** Display wireless network authentication password
- **WPS Via Push Button:** Start WPS function from webpage.
- **WPS Via PIN:** Specify wireless client's PIN code to start WPS function.

Client List



VLAN


A virtual LAN, commonly known as a VLAN, is a group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location.
Virtual LAN :
Enable
Disable
SSID 1 Tag:
100
(1~4094)
Apply
Cancel

Only Available in AP mode

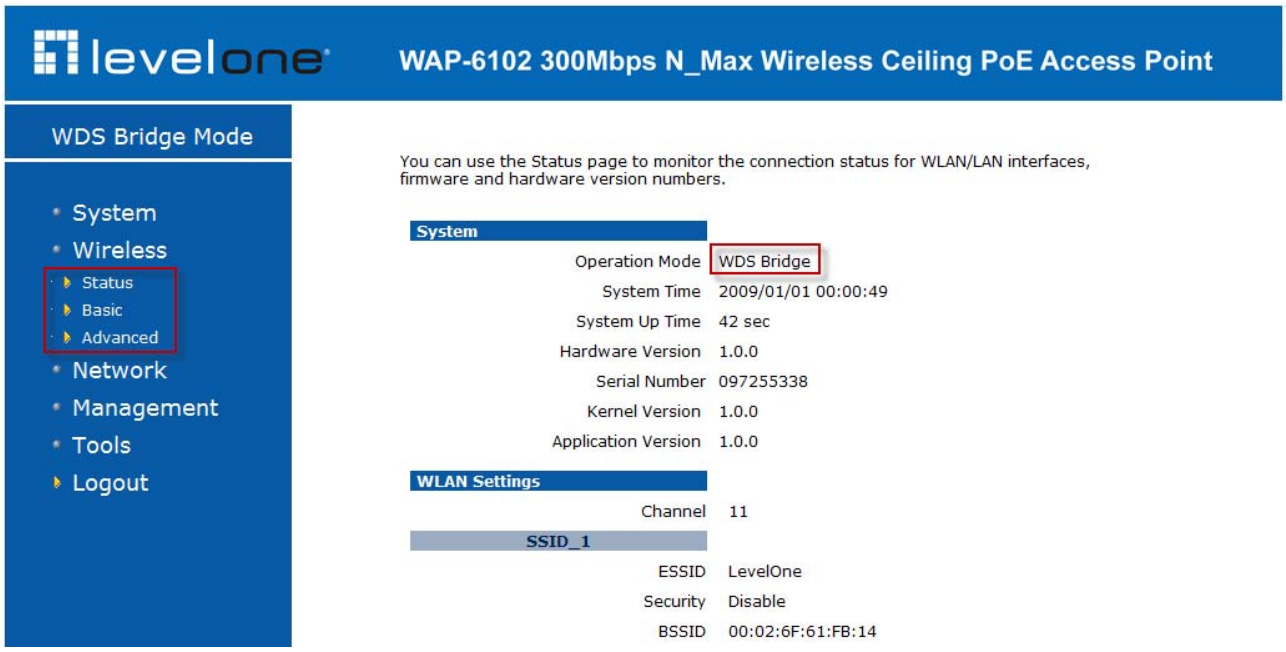
- **Virtual LAN**: Choose to Enable or Disable the VLAN features.
- **SSID1 Tag**: Specify the VLAN tag.

2.2.2 WDS Bridge Configuration

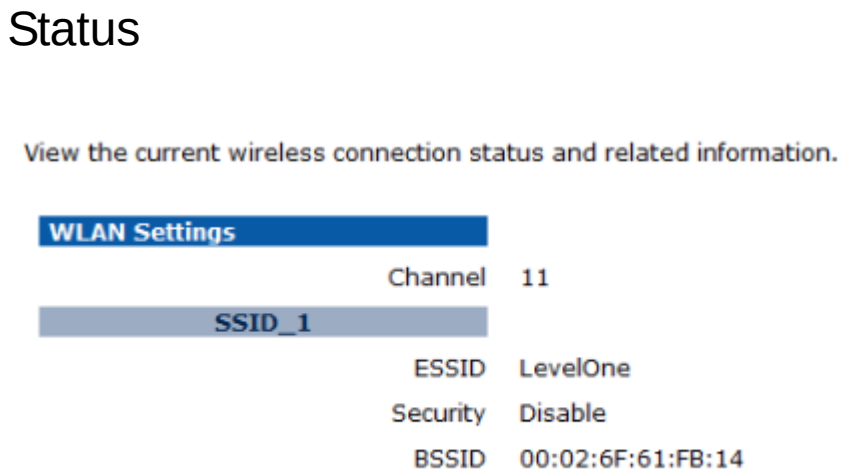
You can only connect to the device via Wireless Client

Please click **System➔ Operation Mode** and Select **WDS Bridge** before you start the configuration

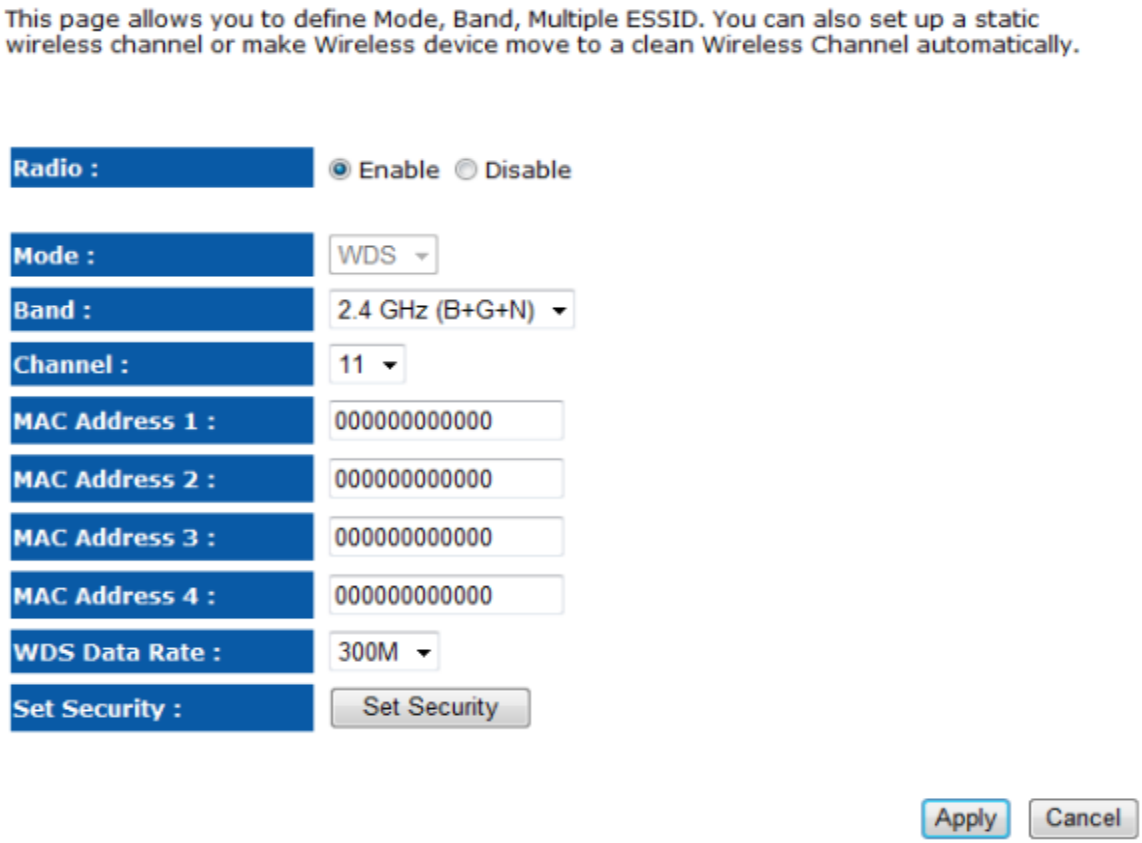
WDS Mode



To configure WDS Mode, please select WDS Bridge in (**System➔ Operation Mode**) (Please refer to: 2.1.1 Operation Mode in Page.3)



Basic

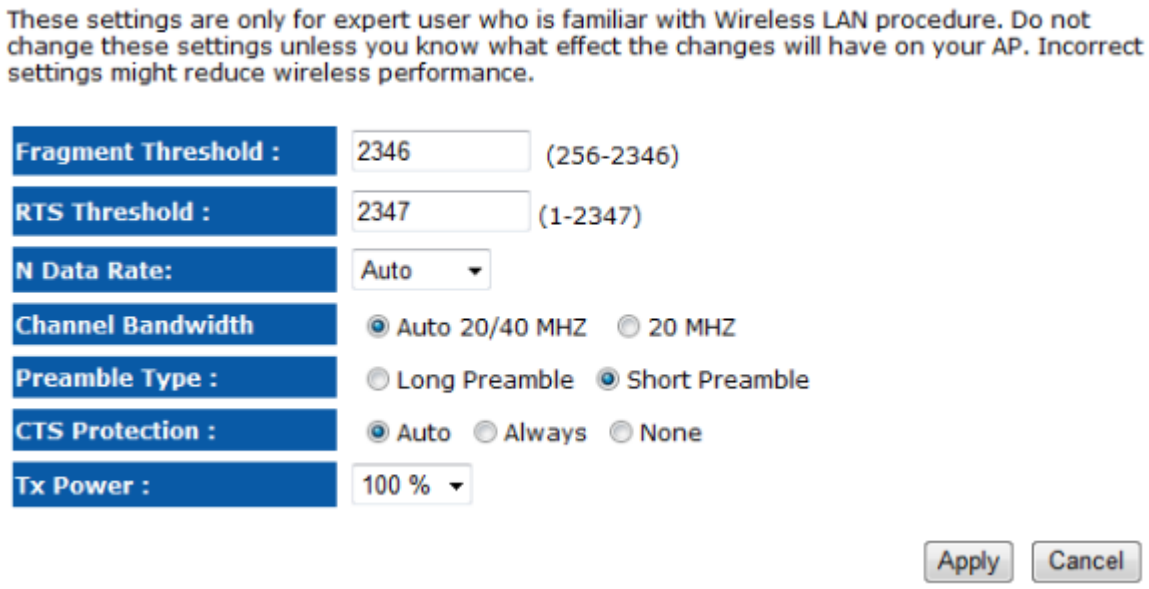


- **Radio**: To enable/disable radio frequency.
- **Mode**: WDS mode allows you to interlink with other AP devices. Setting MAC address and encryption algorithm.
- **Band:** Configure the device into different wireless modes.
  - ✓ **2.4 GHz (B)**
  - ✓ **2.4 GHz (N)**
  - ✓ **2.4 GHz (B+G)**
  - ✓ **2.4 GHz (G)**
  - ✓ **2.4 GHz (B+G+N)**
- **Enabled SSID#:** The device allows you to add up to 4 unique SSID
- **ESSID#:** Description of each configured SSID
- **Channel:** You can manually configure a channel to be used.
- **MAC Address 1~4:** To specify MAC address of other AP devices.

⚠ MAC address will only shows when configured in WDS AP mode.

- **WDS Data Rate:** select a data rate from the drop-down list,
- **Set Security:** Please refer to Security for encryption configuration

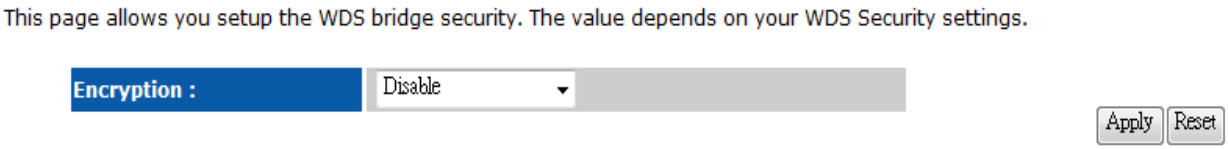
Advanced



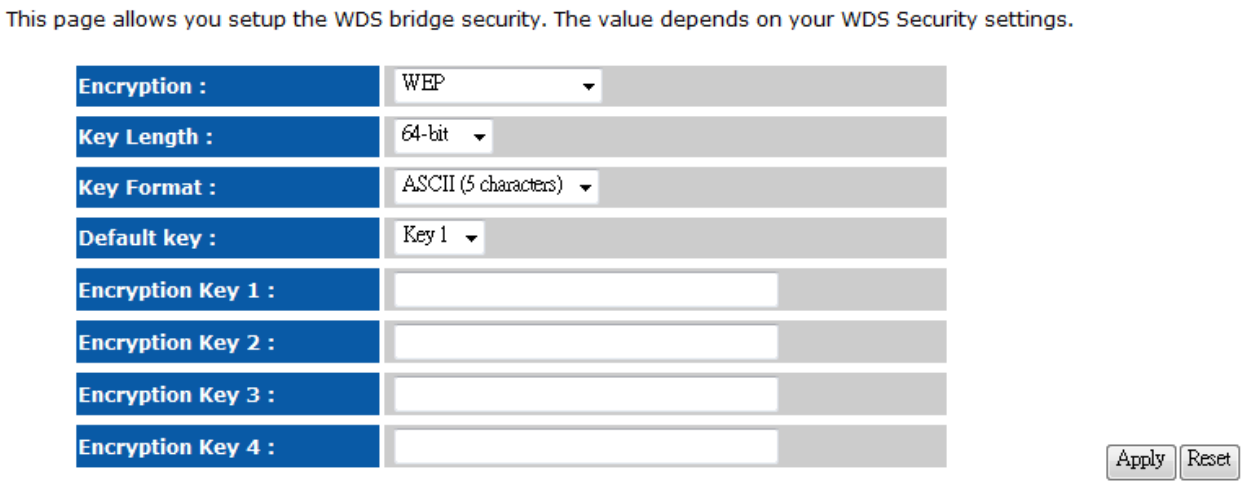
- **Fragment Threshold:** Packets over the specified size will be fragmented in order to improve performance on noisy networks. Specify a value between 256 and 2346. The default value is 2346.
- **RTS Threshold:** Packets over the specified size will use the RTS/CTS mechanism to maintain performance in noisy networks and preventing hidden nodes from degrading the performance. Specify a value between 0 and 2347. The default value is 2347.
- **N Data Rate:** You may select N data rate from the drop-down list, however, it is recommended to select **auto**.
- **Channel Bandwidth:** Select channel bandwidth.
- **Preamble Type:** Select a short or long preamble. For optimum performance it is recommended to also configure the client device as the same preamble type.
- **CTS Protection:** CTS (Clear to Send) can be always enabled, auto, or disabled. By enabled CTS, the Access Point and clients will wait for a 'clear' signal before transmitting. It is recommended to select **auto**.
- **Tx Power:** You may control the transmit output power of the device by selecting a value from the drop-down list. This feature can be helpful in restricting the coverage area of the wireless network.

Security

➢ Encryption: Security: Disabled

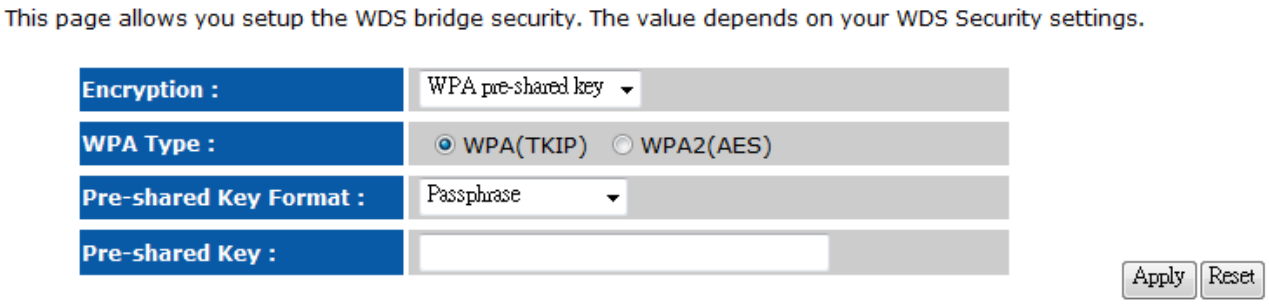

This page allows you setup the WDS bridge security. The value depends on your WDS Security settings.
Encryption :
Disable
Apply
Reset

➢ Encryption: WEP



- **Key Length**: Select a **64-bit** or **128-bit** WEP key length from the drop-down list.
- **Key Format**: Select a key type from the drop-down list. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in **HEX** (hexadecimal - using characters 0-9, A-F) or **ASCII** (American Standard Code for Information Interchange - alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember.
- **Default Tx Key**: You may choose one of your 4 different WEP keys from below.
- **Encryption Key 1-4:** You may enter four different WEP keys.

➢ Encryption: WPA pre-shared key

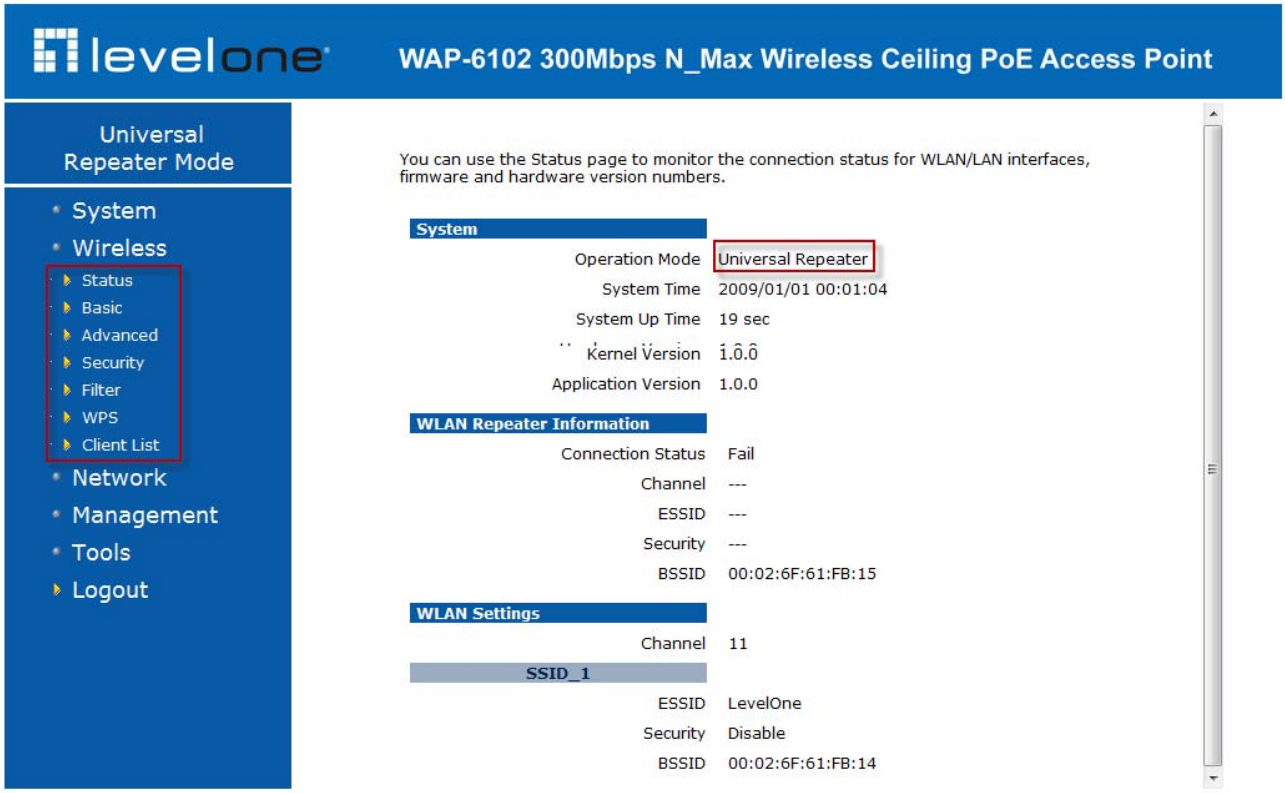


- **WPA Type**: Select TKIP, AES, or WPA2 Mixed. The encryption algorithm used to secure the data communication. **TKIP** (Temporal Key Integrity Protocol) provides per-packet key generation and is based on WEP. **AES** (Advanced Encryption Standard) is a very secure block based encryption. Note that, if the bridge uses the AES option, the bridge can associate with the access point only if the access point is also set to use only AES.
- **Pre-shared Key Type**: The Key Type can be **passphrase** or **Hex** format.
- **Pre-Shared Key**: The key is entered as a pass-phrase of up to 63 alphanumeric characters in ASCII (American Standard Code for Information Interchange) format at both ends of the wireless connection. It cannot be shorter than eight characters, although for proper security it needs to be of ample length and should not be a commonly known phrase. This phrase is used to generate session keys that are unique for each wireless client.

2.2.3 Universal Repeater Configuration

Please click **System**=> **Operation Mode** and Select **Universal Repeater** Before you start the configuration

Repeater Mode



To configure Repeater Mode, please select Universal Repeater in (**System➔ Operation Mode**) (Please refer to: 2.1.1 Operation Mode)

Status

View the current wireless connection status and related information.

WLAN Repeater Information	
Connection Status	Fail
ESSID	---
Security	---
BSSID	00:02:6F:61:FB:15
WLAN Settings	
Channel	11
SSID_1	
ESSID	LevelOne
Security	Disable
BSSID	00:02:6F:61:FB:14

Basic

This page allows you to define Mode, Band, Multiple ESSID. You can also set up a static wireless channel or make Wireless device move to a clean Wireless Channel automatically.

Radio :	Enable / Disable
Mode :	Universal Repeater
Band :	2.4 GHz (B+G+N)
Enabled SSID#:	1
ESSID1 :	LevelOne
Channel :	11
Site Survey :	Site Survey

Apply Cancel

Site Survey

NO.	Select	Channel	SSID	BSSID	Encryption	Authentication	Signal(%)	Mode
1	○	1	WBR-6022TSD	00:11:6B:50:EC:A0	NONE	OPEN	29	11b/g/n

Refresh Connect

- **Radio**: To enable/disable radio frequency.
- **Mode**: Universal Repeater
- **Band:** Configure the device into different wireless modes.
  - ✓ **2.4 GHz (B)**
  - ✓ **2.4 GHz (N)**
  - ✓ **2.4 GHz (B+G)**
  - ✓ **2.4 GHz (G)**
  - ✓ **2.4 GHz (B+G+N)**
- **Enabled SSID#:** The device allows you to add up to 4 unique SSID
- **ESSID#:** Description of each configured SSID
- **Channel: Y**ou can manually configure a channel to be used.
- **Site Survey:** List out all connected devices.

Advanced

These settings are only for expert user who is familiar with Wireless LAN procedure. Do not change these settings unless you know what effect the changes will have on your AP. Incorrect settings might reduce wireless performance.

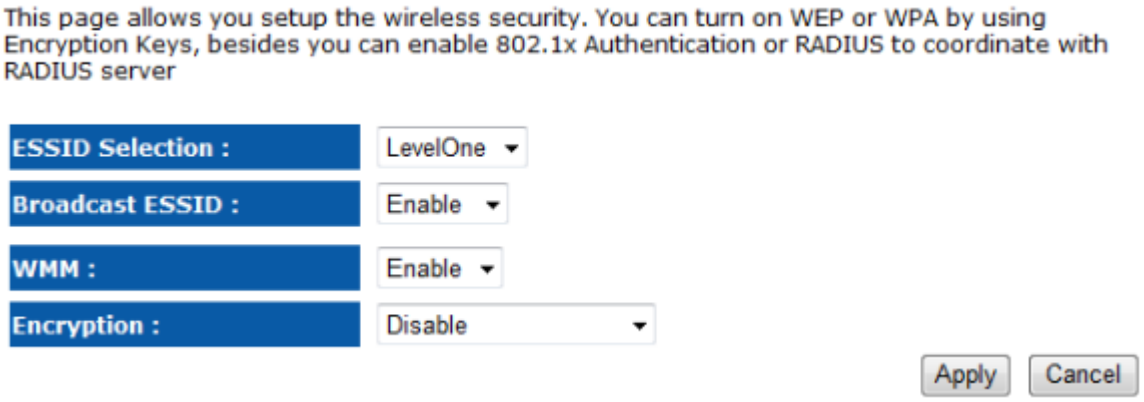
Fragment Threshold :	2346	(256-2346)
RTS Threshold :	2347	(1-2347)
Beacon Interval :	100	(20-1024 ms)
DTIM Period :	1	(1-255)
N Data Rate:	Auto	
Channel Bandwidth	◉ Auto 20/40 MHZ ○ 20 MHZ	
Preamble Type :	○ Long Preamble ◉ Short Preamble	
CTS Protection :	◉ Auto ○ Always ○ None	
Tx Power :	100 %	

Apply Cancel

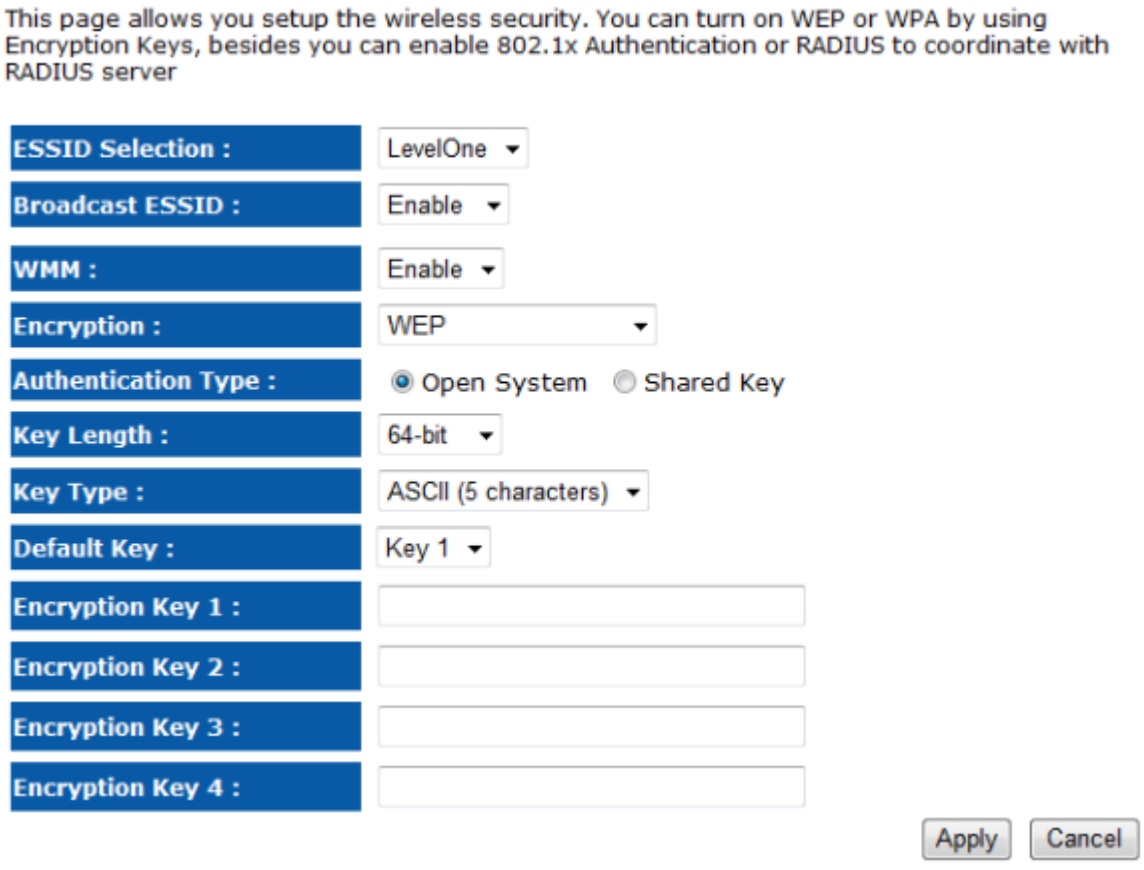
- **Fragment Threshold:** Packets over the specified size will be fragmented in order to improve performance on noisy networks. Specify a value between 256 and 2346. The default value is 2346.
- **RTS Threshold:** Packets over the specified size will use the RTS/CTS mechanism to maintain performance in noisy networks and preventing hidden nodes from degrading the performance. Specify a value between 0 and 2347. The default value is 2347.
- **Beacon Interval:** Beacons are packets sent by a wireless Access Point to synchronize wireless devices. Specify a Beacon Interval value between 25 and 1000. The default value is set to 100 milliseconds.
- **DTIM Period:** A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages. When the wireless Access Point has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Period value. Wireless clients detect the beacons and awaken to receive the broadcast and multicast messages. The default value is 1. Valid settings are between 1 and 10.
- **N Data Rate:** You may select N data rate from the drop-down list, however, it is recommended to select **auto**.
- **Channel Bandwidth:** Select channel bandwidth
- **Preamble Type:** Select a short or long preamble. For optimum performance it is recommended to also configure the client device as the same preamble type.
- **CTS Protection:** CTS (Clear to Send) can be always enabled, auto, or disabled. By enabled CTS, the Access Point and clients will wait for a 'clear' signal before transmitting. It is recommended to select **auto**.
- **Tx Power:** You may control the transmit output power of the device by selecting a value from the drop-down list. This feature can be helpful in restricting the coverage area of the wireless network.

Security

➢ Encryption: Disabled

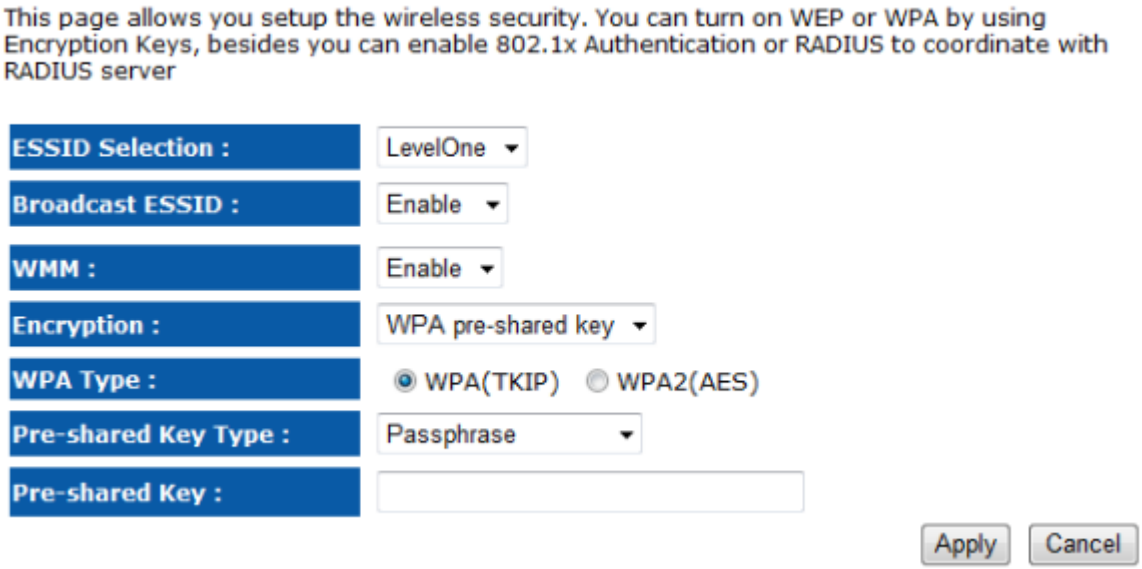

This page allows you setup the wireless security. You can turn on WEP or WPA by using Encryption Keys, besides you can enable 802.1x Authentication or RADIUS to coordinate with RADIUS server
ESSID Selection :
LevelOne
Broadcast ESSID :
Enable
WMM :
Enable
Encryption :
Disable
Apply
Cancel

➢ Encryption: WEP



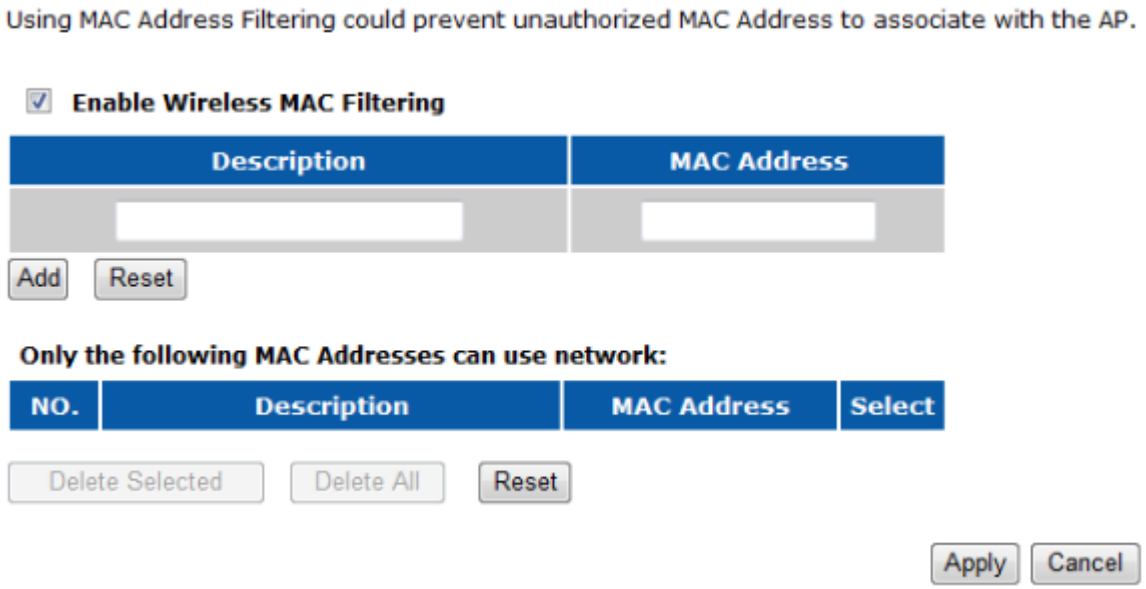
- **ESSID Selection**: As this device supports multiple SSIDs, it is possible to configure a different security mode for each SSID (profile). Select an SSID from the drop-down list.
- **Broadcast SSID**: Select **Enable** or **Disable** from the drop-down list. This is the SSID broadcast feature. When this option is set to Enable, your wireless network name is broadcast to anyone within the range of your signal. If you're not using encryption then they could connect to your network. When this is disabled, you must enter the Wireless Network Name (SSID) on the client manually to connect to the network.
- **WMM**: Choose to **Enable** or **Disable** WMM. This is the Quality of Service (QoS) feature for prioritizing voice and video applications.
- **Encryption**: Select **WEP** from the drop-down list.
- **Authentication Type:** Select **Open System**, **Shared Key, or auto**. Authentication method from the drop-down list. An open system allows any client to authenticate as long as it conforms to any MAC address filter policies that may have been set. All authentication packets are transmitted without encryption. Shared Key sends an unencrypted challenge text string to any device attempting to communicate with the AP. The device requesting authentication encrypts the challenge text and sends it back to the access point. If the challenge text is encrypted correctly, the access point allows the requesting device to authenticate. It is recommended to select Auto if you are not sure which authentication type is used.
- **Key Length**: Select a **64-bit** or **128-bit** WEP key length from the drop-down list.
- **Key Type**: Select a key type from the drop-down list. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in **HEX** (hexadecimal - using characters 0-9, A-F) or **ASCII** (American Standard Code for Information Interchange - alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember.
- **Default Key**: You may choose one of your 4 different WEP keys from below.
- **Encryption Key 1-4:** You may enter four different WEP keys.

➢ Encryption: WPA pre-shared key

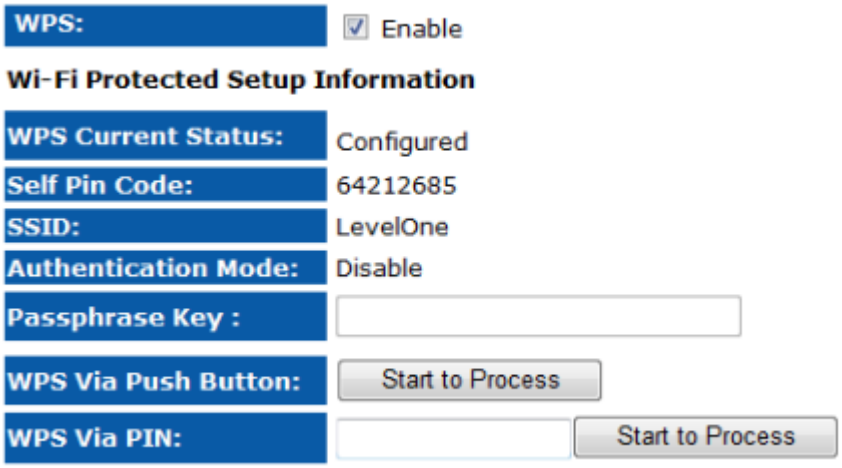


- **ESSID Selection**: As this device supports multiple SSIDs, it is possible to configure a different security mode for each SSID (profile). Select an SSID from the drop-down list.
- **Broadcast SSID**: Select **Enable** or **Disable** from the drop-down list. This is the SSID broadcast feature. When this option is set to Enable, your wireless network name is broadcast to anyone within the range of your signal. If you're not using encryption then they could connect to your network. When this is disabled, you must enter the Wireless Network Name (SSID) on the client manually to connect to the network.
- **WMM**: Choose to **Enable** or **Disable** WMM. This is the Quality of Service (QoS) feature for prioritizing voice and video applications.
- **Encryption**: Select **WPA pre-shared key** from the drop-down list.
- **WPA Type**: Select TKIP, AES, or WPA2 Mixed. The encryption algorithm used to secure the data communication. **TKIP** (Temporal Key Integrity Protocol) provides per-packet key generation and is based on WEP. **AES** (Advanced Encryption Standard) is a very secure block based encryption. Note that, if the bridge uses the AES option, the bridge can associate with the access point only if the access point is also set to use only AES.
- **Pre-shared Key Type**: The Key Type can be **passphrase** or **Hex** format.
- **Pre-Shared Key**: The key is entered as a pass-phrase of up to 63 alphanumeric characters in ASCII (American Standard Code for Information Interchange) format at both ends of the wireless connection. It cannot be shorter than eight characters, although for proper security it needs to be of ample length and should not be a commonly known phrase. This phrase is used to generate session keys that are unique for each wireless client.

Filter

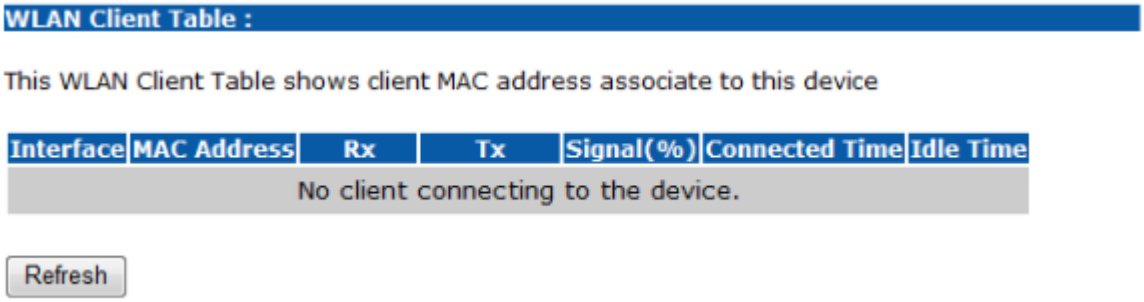

Using MAC Address Filtering could prevent unauthorized MAC Address to associate with the AP.
Enable Wireless MAC Filtering
Description
MAC Address
Add
Reset
Only the following MAC Addresses can use network:
NO.
Description
MAC Address
Select
Delete Selected
Delete All
Reset
Apply
Cancel

WPS


WPS:
Enable
Wi-Fi Protected Setup Information
WPS Current Status:
Configured
Self Pin Code:
64212685
SSID:
LevelOne
Authentication Mode:
Disable
Passphrase Key :
WPS Via Push Button:
Start to Process
WPS Via PIN:
Start to Process

- **WPS Current Status:** Display current configuration is configured or un-configured. The default setting will display un-configured status but if any of following occur will display configured status: 1. Configuration by an external registrar. 2. Automatic configuration by internal registrar. 3. Manual configuration by user.
- **Self Pin Code:** Pin code is unique and automatically generated.
- **SSID:** Display wireless network name
- **Authentication Mode:** Display wireless network authentication types
- **Passphrase Key:** Display wireless network authentication password
- **WPS Via Push Button:** Start WPS function from webpage.
- **WPS Via PIN:** Specify wireless client's PIN code to start WPS function.

Client List



2.3. Network

2.3.1. Status

View the current wireless connection status and related information.

LAN Settings

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
MAC Address	00:02:6F:61:FB:14

2.3.2. LAN

You can enable the device's DHCP server to dynamically allocate IP Addresses to your LAN client PCs. The device must have an IP Address for the Local Area Network.

Bridge Type :	Static IP
IP Address :	192.168.1.1
IP Subnet Mask :	255.255.255.0
Default Gateway :	
DNS Type:	Static
First DNS Address:	192.168.1.1
Second DNS Address:	0.0.0.0
802.1d Spanning Tree :	Disabled

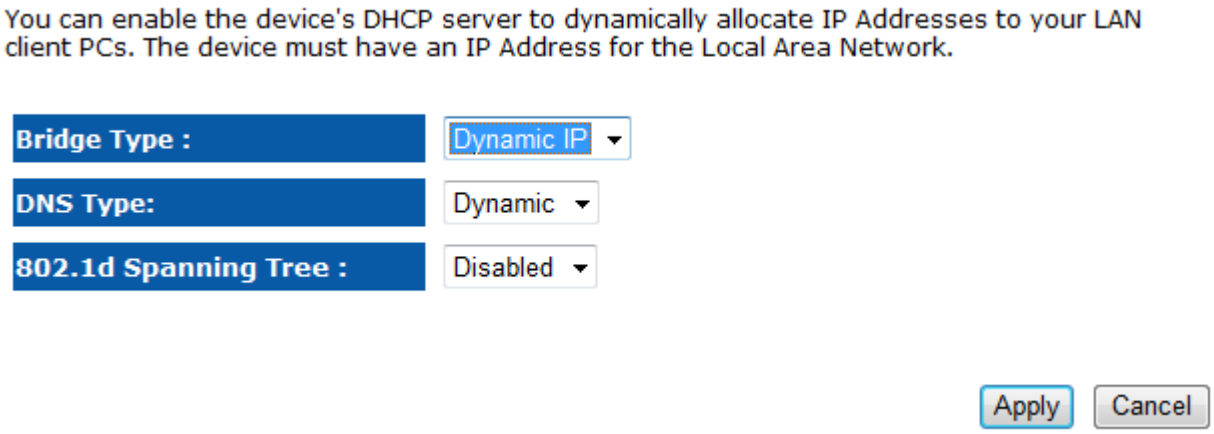
DHCP Server **(AP Mode Only)**

DHCP Server :	Disabled
Lease Time :	Forever
Start IP :	192.168.1.100
End IP :	192.168.1.200
Domain Name :	wap-6102
First DNS Address	
Second DNS Address	

Apply Cancel

- **Bridge Type:** Select Static IP or Dynamic IP from the drop-down list. If you select Static IP, you will be required to specify an IP address and subnet mask. If Dynamic IP is selected, then the IP address is received automatically from the external DHCP server.
- **IP Address:** Specify an IP address.
- **IP Subnet Mask:** Specify a subnet mask for the IP address.
- **Default Gateway:** Specify the router IP address which is used to route TCP/IP traffic destined to other network/subnet addresses not listed in local routing table.
- **DNS Type:** Select Dynamic for automatic retrieve DNS IP address or select Static for manually defined.
- **First DNS Address:** Specify the primary DNS IP address.
- **Second DNS Address:** Specify the secondary DNS IP address.
- **802.1d Spanning Tree:** Select Enable or Disable from the drop-down list. Enabling spanning tree will avoid redundant data loops.
- **DHCP server:** You may Enable of Disable DHCP server.
- **Lease Time:** Define the maximum usage.
- **Start IP:** Specify the first IP address for the DHCP range.
- **End IP:** Specify the last IP address for the DHCP range.
- **Domain Name:** Specify the last IP address for DHCP range.
- **First DNS Address:** Specify the primary DNS IP address for DHCP server.
- **Second DNS Address:** Specify the secondary DNS IP address for DHCP server.

Dynamic IP
(Only work with AP Mode)

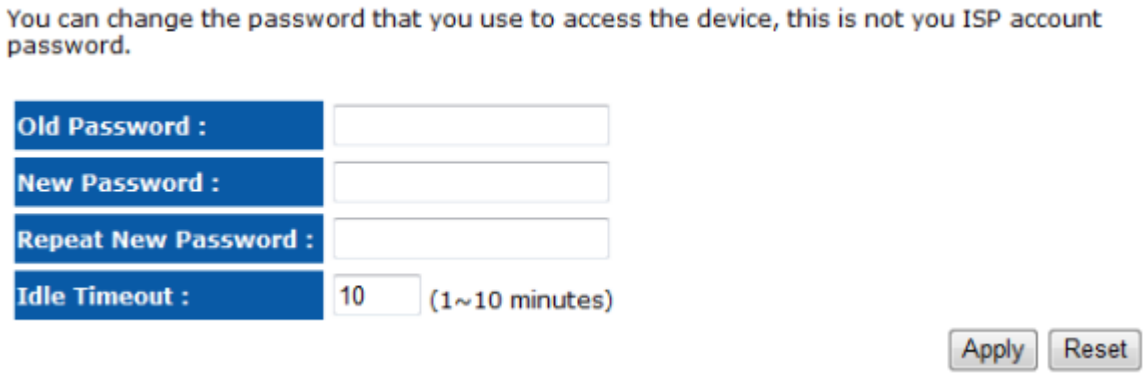

You can enable the device's DHCP server to dynamically allocate IP Addresses to your LAN client PCs. The device must have an IP Address for the Local Area Network.
Bridge Type :
Dynamic IP
DNS Type:
Dynamic
802.1d Spanning Tree :
Disabled
Apply
Cancel

- **Bridge Type:** Select Static IP or Dynamic IP from the drop-down list. If you select Static IP, you will be required to specify an IP address and subnet mask. If Dynamic IP is selected, then the IP address is received automatically from the external DHCP server.
- **DNS Type:** Select Dynamic to automatic retrieve DNS IP address or select Static for manually defined.
- **802.1d Spanning Tree:** Select Enable or Disable from the drop-down list. Enabling spanning tree will avoid redundant data loops.

2.4. Management

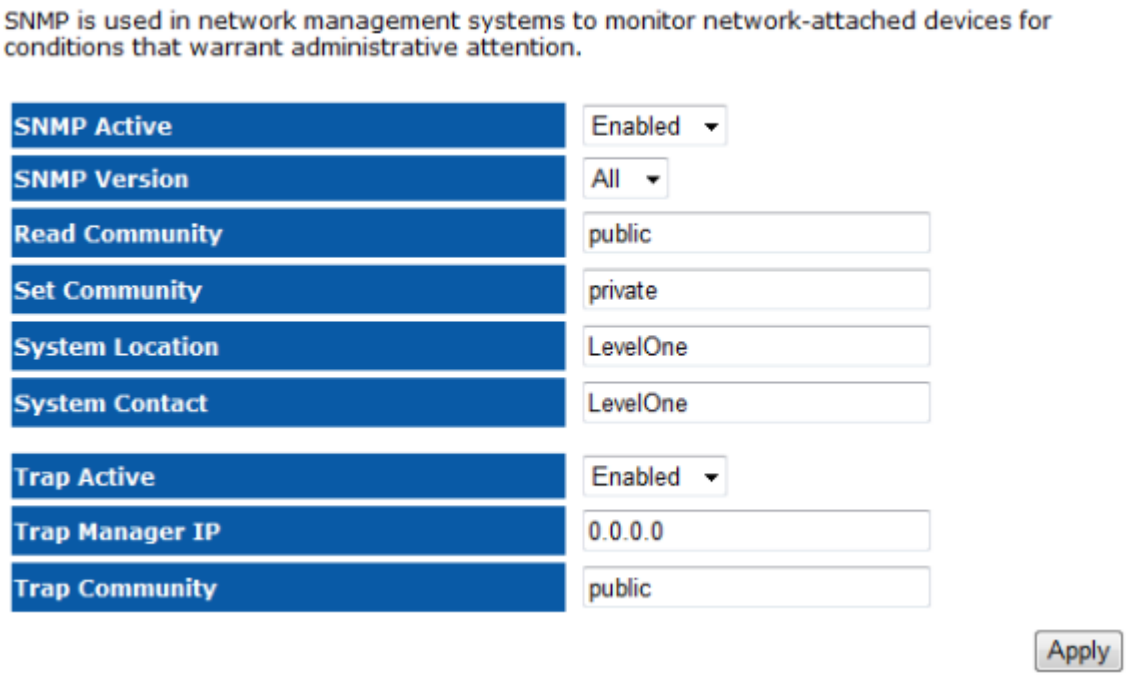
2.4.1. Admin

Change current login password of the device. It is recommended to change the default password for security reasons.


You can change the password that you use to access the device, this is not you ISP account password.
Old Password :
New Password :
Repeat New Password :
Idle Timeout :
10
(1~10 minutes)
Apply
Reset

2.4.2. SNMP

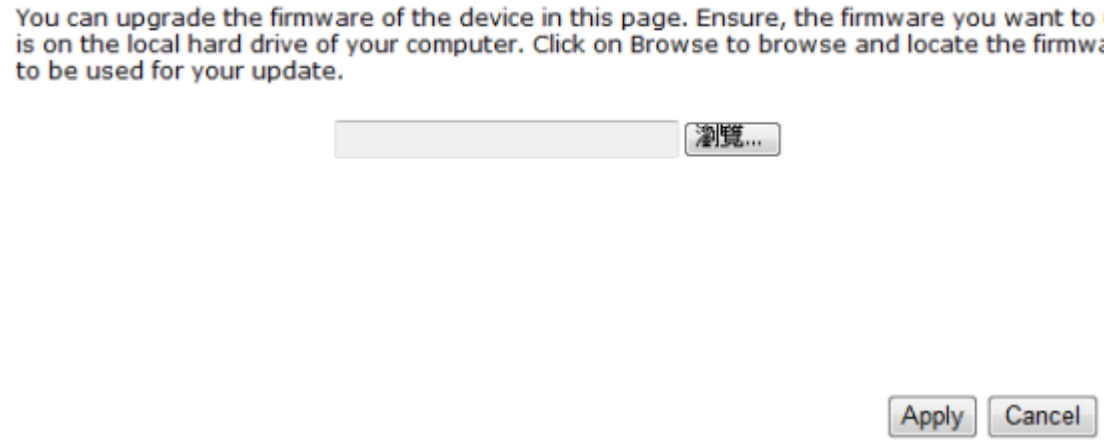
Allows you to assign the contact details, location, community name and trap settings for SNMP. This is a networking management protocol used to monitor network-attached devices. SNMP allows messages (called protocol data units) to be sent to various parts of a network. Upon receiving these messages, SNMP-compatible devices (called agents) return data stored in their Management Information Bases.



- **SNMP Active**: Choose to **enable** or **disable** the SNMP feature.
- **SNMP Version**: You may select a specific version or select **All** from the drop-down list.
- **Read Community**: Specify the password for access the SNMP community for read only access.
- **Set Community**: Specify the password for access to the SNMP community with read/write access.
- **System Location**: Specify the location of the device.
- **System Contact**: Specify the contact details of the device.
- **Trap Active**: Choose to **enable** or **disable** the SNMP trapping feature. .
- **Trap Manager IP**: Specify the password for the SNMP trap community.
- **Trap Community**: Specify the name of SNMP trap community.

2.4.3. Firmware

Allows you to upgrade the firmware of the device in order to improve the functionality and performance.

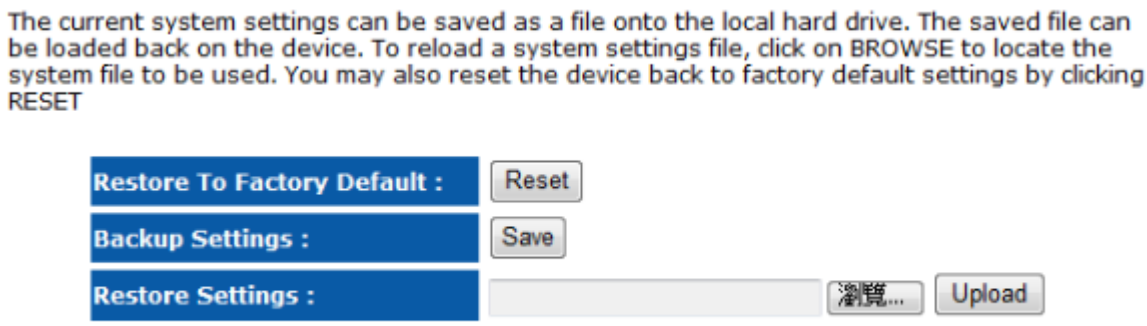

You can upgrade the firmware of the device in this page. Ensure, the firmware you want to use is on the local hard drive of your computer. Click on Browse to browse and locate the firmware to be used for your update.
瀏覽...
Apply
Cancel

Ensure that you have downloaded the appropriate firmware from the vendor's website.

Connect the device to your PC using an Ethernet cable, as the firmware cannot be upgraded with wireless interface.

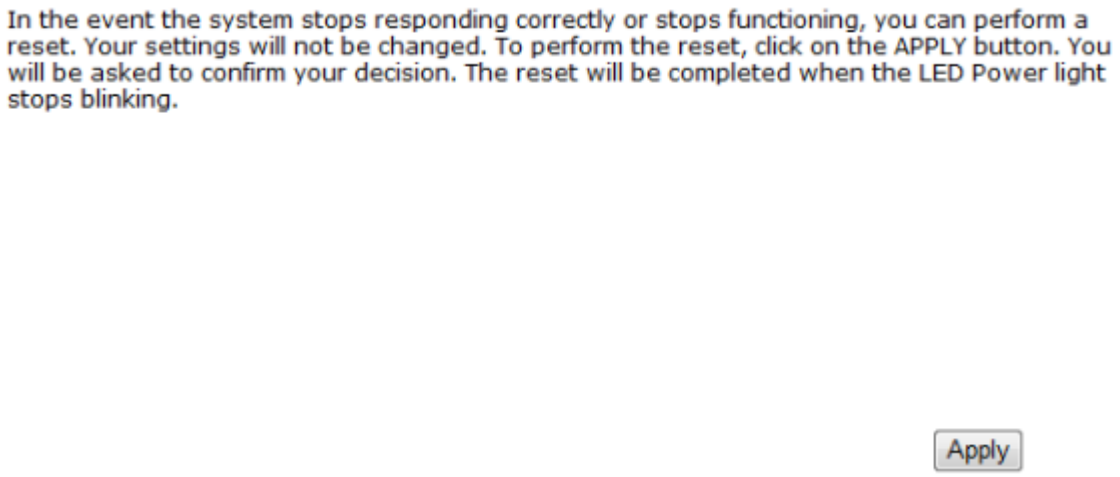
2.4.4. Configure

This allows you to restore to factory default setting or backup/restore your current setting.


The current system settings can be saved as a file onto the local hard drive. The saved file can be loaded back on the device. To reload a system settings file, click on BROWSE to locate the system file to be used. You may also reset the device back to factory default settings by clicking RESET
Restore To Factory Default :
Reset
Backup Settings :
Save
Restore Settings :
瀏覽...
Upload

2.4.5. Reset

This will only reset you devices with current configuration unaffected.

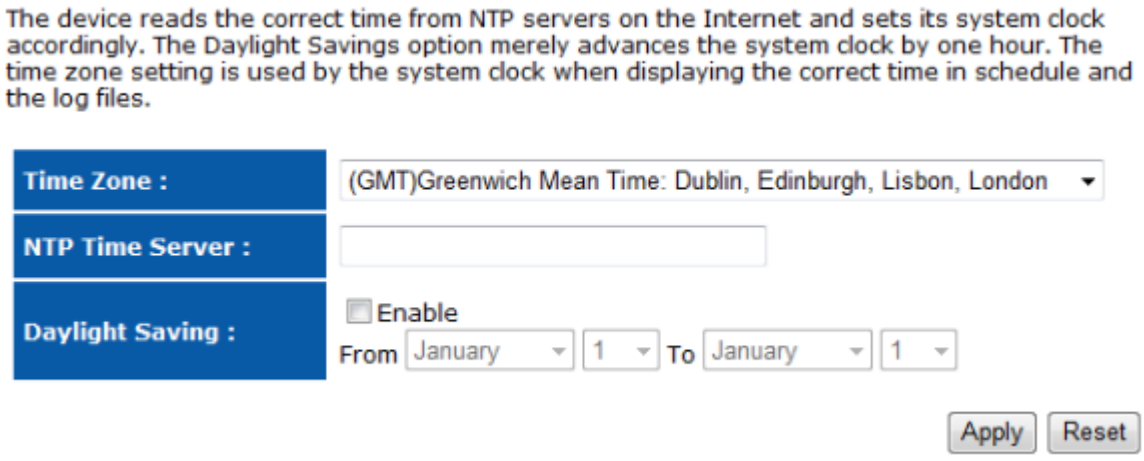

In the event the system stops responding correctly or stops functioning, you can perform a reset. Your settings will not be changed. To perform the reset, click on the APPLY button. You will be asked to confirm your decision. The reset will be completed when the LED Power light stops blinking.
Apply

2.5. Tools

2.5.1. Time Setting

This feature allows you to configure, update, and maintain the correct time on the device's internal system clock as well as configure the time zone. The date and time of the device can be configured manually or by synchronizing with a time server.

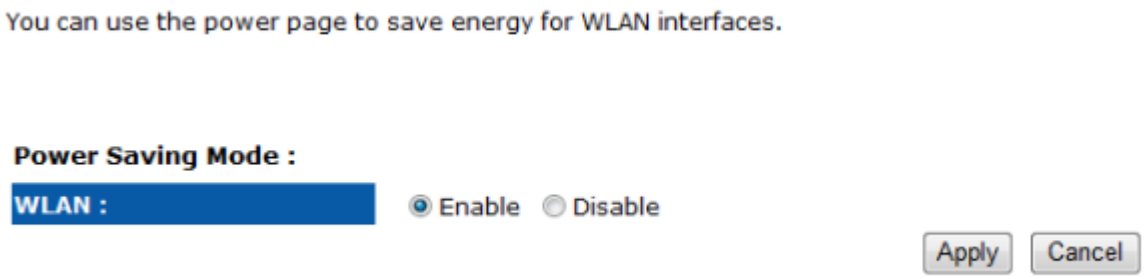
If the device losses power for any reason, it will not be able to keep its clock running, and will not display the correct time once the device has been restarted. Therefore, you must re-enter the correct date and time.


The device reads the correct time from NTP servers on the Internet and sets its system clock accordingly. The Daylight Savings option merely advances the system clock by one hour. The time zone setting is used by the system clock when displaying the correct time in schedule and the log files.
Time Zone :
(GMT)Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
NTP Time Server :
Daylight Saving :
Enable
From January 1 To January 1
Apply
Reset

- **Time Zone**: Select time zone.
- **NTP Time Server**: Specify the NTP server's IP address for time synchronization.
- **Daylight Saving**: To enable daylight savings time.

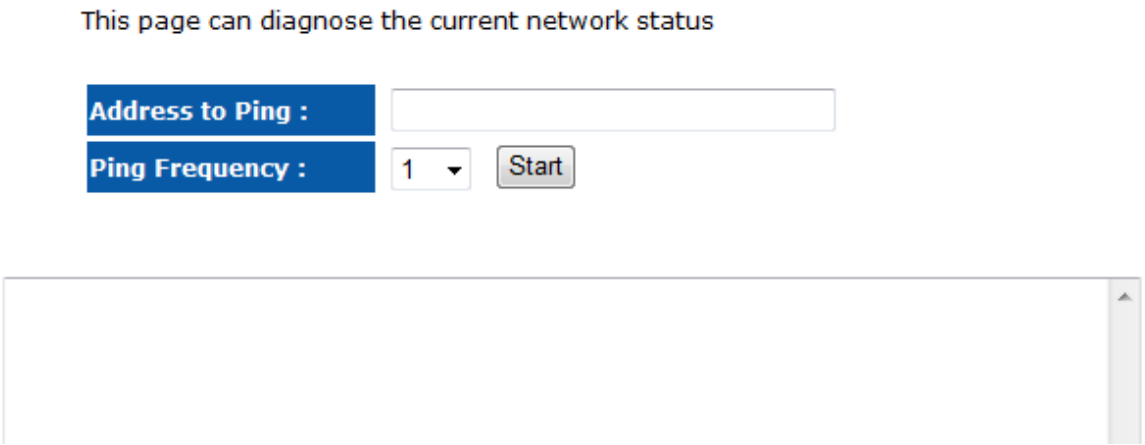
2.5.2. Power Saving

(Only work with AP Mode)

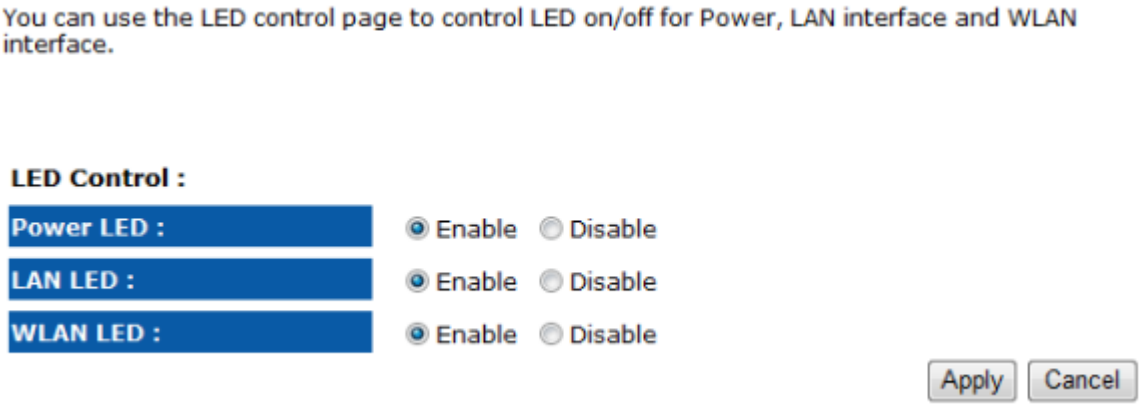


2.5.3. Diagnosis

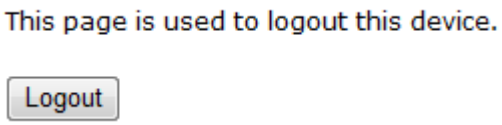
Check whether a network destination is reachable with ping service.



2.5.4. LED Control



2.6. Logout



Appendix A – SPECIFICATIONS

Frequency Band	2.400～2.484 GHz
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation Technology	- OFDM: BPSK, QPSK, 16-QAM, 64-QAM - DBPSK, DQPSK, CCK
Operating Channels	11 for North America, 14 for Japan, 13 for Europe
Receive Sensitivity (Typical)	- IEEE802.11n MCS8 @ -90dBm MCS15 @ -70dBm - IEEE802.11g 6Mbps@ -92dBm 54Mbps@ -72dBm - IEEE802.11b 1Mbps@ -93dBm 11Mbps@ -89dBm
Available transmit power	Maximum 16dBm
Antenna *2	Directional internal antenna TNC type; Peak Gain = 4dBi

Appendix B – FCC INTERFERENCE STATEMENT

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

We declare that the product is limited in CH1~CH11 by specified firmware controlled in the USA.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Appendix C – IC Interference Statement

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device has been designed to operate with an antenna having a maximum gain of 2 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.